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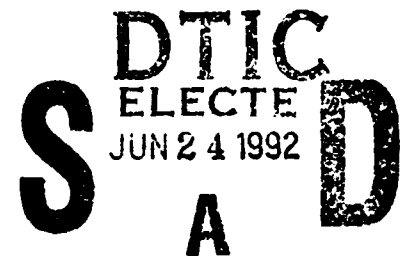
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NASA/DoD Aerospace Knowledge Diffusion Research Project

NASA Technical Memorandum 101534

Report Number 1: Part 2

*Technical Communications in Aerospace:
Results of Phase 1 Pilot Study*



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NASA

National Aeronautics and Space Administration

Department of Defense

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* Published under separate cover

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A-1	

APPENDIX A

SURVEY INSTRUMENT

1 2 3 4

TECHNICAL COMMUNICATIONS IN AERONAUTICS

1. In your work, how important is it for *YOU* to communicate technical information effectively? Col.

1	2	3	5
Very Important	Somewhat Important	Not at all Important	

2. How many hours do *YOU* spend each week communicating technical information *TO* others? _____ Hours 6-7

3. How many hours do *YOU* spend each week working with technical communications *FROM* others? _____ Hours 8-9

4. As you have advanced professionally, how has the amount of time *YOU* spend communicating technical information *TO OTHERS* changed? 10

1	2	3	
Increased	Stayed the Same	Decreased	

5. As you have advanced professionally, how has the amount of time *YOU* spend working with technical communications received *FROM OTHERS* changed? 11

1	2	3	
Increased	Stayed the Same	Decreased	

6. Approximately how many times in the past *six months* did you write/prepare:

Letters	_____ times in the past 6 months	Journal articles	_____	12- 33
Memos	_____	Conference/Meeting papers	_____	
Technical reports-Government	_____	Trade/Promotional literature	_____	
Technical reports-Other	_____	Press releases	_____	
Proposals	_____	Drawings/Specifications	_____	
Technical manuals	_____	Speeches	_____	
Computer program documentation	_____	Audio/Visual materials	_____	

7. How many times in the past *one month* did you use materials written/prepared by other people? 54-
89

Letters	_____ # read/used in past 1 month	Journal articles	_____	
Memos	_____	Conference/Meeting papers	_____	
Technical reports-Government	_____	Trade/Promotional literature	_____	
Technical reports-Other	_____	Drawings/Specifications	_____	
Proposals	_____	Audio/Visual materials	_____	
Technical Manuals	_____			
Computer program documentation	_____			

8. When you write/prepare technical communications, do you receive help from:

	Always	Usually	Sometimes	Never	90- 95
Other colleagues	_____	_____	_____	_____	
Secretaries	_____	_____	_____	_____	
Technical writers or editors	_____	_____	_____	_____	
A thesaurus/dictionary	_____	_____	_____	_____	
A style manual	_____	_____	_____	_____	
A grammar hotline	_____	_____	_____	_____	

APPENDIX A

9. Which of the following statements *BEST* represents how the artwork for *YOUR* visual aids (charts, graphs) is prepared? (Check Only One)

- ☐ I do my own artwork without a computer
☐ I do my own artwork with a computer
☐ The graphics department does my artwork
☐ Sometimes I do it and sometimes the graphics department does it
☐ A secretary does it
☐ The artwork is prepared elsewhere

96

10. Have you ever taken a course(s) in technical communications/writing?

- ☐ Yes, as an Undergraduate ☐ Yes, after graduation ☐ Yes, both ☐ No (Skip to Q. 12)

97

11. How well did this course help *YOU* communicate technical information?

- ☐ A Lot ☐ A Little ☐ Did not Help

98

12. In your opinion, which of the following topics should be included in an **undergraduate** technical communications course for aeronautical engineers and scientists?

- | Yes | No | <i>Principles</i> | Yes | No | <i>Mechanics</i> |
|--------------------------|--------------------------|---|--------------------------|--------------------------|------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Defining the communication's purpose | <input type="checkbox"/> | <input type="checkbox"/> | Abbreviations |
| <input type="checkbox"/> | <input type="checkbox"/> | Assessing readers' needs | <input type="checkbox"/> | <input type="checkbox"/> | Acronyms |
| <input type="checkbox"/> | <input type="checkbox"/> | Organizing information | <input type="checkbox"/> | <input type="checkbox"/> | Capitalization |
| <input type="checkbox"/> | <input type="checkbox"/> | Developing paragraphs (introductions, transitions, and conclusions) | <input type="checkbox"/> | <input type="checkbox"/> | Numbers |
| <input type="checkbox"/> | <input type="checkbox"/> | Writing sentences (active vs. passive voice, parallel ideas, shifts in person or tense) | <input type="checkbox"/> | <input type="checkbox"/> | Punctuation |
| <input type="checkbox"/> | <input type="checkbox"/> | Using standard English grammar | <input type="checkbox"/> | <input type="checkbox"/> | References |
| <input type="checkbox"/> | <input type="checkbox"/> | Notetaking and quoting | <input type="checkbox"/> | <input type="checkbox"/> | Spelling |
| <input type="checkbox"/> | <input type="checkbox"/> | Editing and revising | <input type="checkbox"/> | <input type="checkbox"/> | Symbols |
| <input type="checkbox"/> | <input type="checkbox"/> | Choosing words (avoiding wordiness, jargon, slang, sexist terms) | <input type="checkbox"/> | <input type="checkbox"/> | |
| <input type="checkbox"/> | <input type="checkbox"/> | Using information technology (video conferencing, electronic data bases, etc.) | <input type="checkbox"/> | <input type="checkbox"/> | |

99-
116

13. Which of the following on-the-job communications should be included in an **undergraduate technical communications** course for aeronautical engineers and scientists?

- | Yes | No | | Yes | No | <i>Reports:</i> |
|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|-----------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Abstracts | <input type="checkbox"/> | <input type="checkbox"/> | Feasibility |
| <input type="checkbox"/> | <input type="checkbox"/> | Letters | <input type="checkbox"/> | <input type="checkbox"/> | Investigative |
| <input type="checkbox"/> | <input type="checkbox"/> | Memos | <input type="checkbox"/> | <input type="checkbox"/> | Laboratory |
| <input type="checkbox"/> | <input type="checkbox"/> | Instructions | <input type="checkbox"/> | <input type="checkbox"/> | Progress |
| <input type="checkbox"/> | <input type="checkbox"/> | Journal articles | <input type="checkbox"/> | <input type="checkbox"/> | Test |
| <input type="checkbox"/> | <input type="checkbox"/> | Literature reviews | <input type="checkbox"/> | <input type="checkbox"/> | Trip |
| <input type="checkbox"/> | <input type="checkbox"/> | Manuals | <input type="checkbox"/> | <input type="checkbox"/> | Trouble |
| <input type="checkbox"/> | <input type="checkbox"/> | Newsletter articles | <input type="checkbox"/> | <input type="checkbox"/> | |
| <input type="checkbox"/> | <input type="checkbox"/> | Oral presentations | <input type="checkbox"/> | <input type="checkbox"/> | |
| <input type="checkbox"/> | <input type="checkbox"/> | Specifications | <input type="checkbox"/> | <input type="checkbox"/> | |
| <input type="checkbox"/> | <input type="checkbox"/> | Use of information sources | <input type="checkbox"/> | <input type="checkbox"/> | |

117-
134

14. Do *YOU* use computer technology to prepare technical communications?

- ☐ Always ☐ Usually ☐ Sometimes ☐ Never (Skip to Q. 19)

135

15. Has computer technology increased *YOUR* ability to communicate technical information?

- ☐ A Lot ☐ A Little ☐ Not at All

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APPENDIX A

16. Do *YOU* use any of the following software for preparing written technical communications?

Yes No

☐ ☐ Word processing
☐ ☐ Outliners and prompters
☐ ☐ Grammar and style checkers
☐ ☐ Spelling checkers

Yes No

☐ ☐ Thesaurus
☐ ☐ Business graphics
☐ ☐ Scientific graphics

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143

17. Do *YOU* use an integrated graphics, text, and modeling engineering workstation for preparing written technical communications?

☐ Always ☐ Usually ☐ Sometimes ☐ Never

144

18. Do *YOU* use electronic or desk-top publishing systems for preparing written technical communications?

☐ Always ☐ Usually ☐ Sometimes ☐ Never

145

19. How do *YOU* view your use of the following information technologies in communicating technical information?

<i>Information Technologies</i>	<i>I already use it</i>	<i>I don't use it, but may in the future</i>	<i>I don't use it, and doubt if I will</i>
Audio tapes and cassettes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Motion picture film	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video tape	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Desk-top/electronic publishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Floppy disks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Computer cassette/cartridge tapes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electronic mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electronic bulletin boards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FAX or TELEX	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electronic data bases	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video conferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teleconferencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Micrographics and microforms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laser disc/video disc/CD-ROM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electronic networks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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160

20. When faced with solving a technical problem, do you get technical information from:

	<i>Always</i>	<i>Usually</i>	<i>Sometimes</i>	<i>Never</i>
Personal knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Informal discussions with colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussions with supervisors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussions with experts <i>in</i> your organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discussions with experts <i>outside</i> of your organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical reports-Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical reports-Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Professional journals/conference meeting papers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Textbooks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Handbooks and standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Technical information sources, such as on-line data bases, indexing and abstracting guides, CD-ROM, and current awareness tools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Librarians/technical information specialists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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APPENDIX A

21. What types of technical information do you *USE* in performing your present duties?

Yes	No	
___	___	Scientific and technical information
___	___	Experimental techniques
___	___	Codes of standards and practices
___	___	Design procedures and methods
___	___	Computer programs
___	___	Government rules and regulations
___	___	In-house technical data
___	___	Product and performance characteristics
___	___	Economic information
___	___	Technical specifications
___	___	Patents

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183

22. What types of technical information do you *PRODUCE* (or expect to produce) in performing your present duties?

Yes	No	
___	___	Scientific and technical information
___	___	Experimental techniques
___	___	Codes of standards and practices
___	___	Design procedures and methods
___	___	Computer programs
___	___	Government rules and regulations
___	___	In-house technical data
___	___	Product and performance characteristics
___	___	Economic information
___	___	Technical specifications
___	___	Patents

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194

23. How often do you use the library or a technical information center? (Circle Choice)

1 — Daily	4 — Two to three times a month
2 — Two to six times a week	5 — Once a month
3 — Once a week	6 — Less than once a month
	7 — Do not use

195

24. Do you use electronic data bases to find bibliographic citations and abstracts? 1 — Yes 2 — No (Skip to Q. 26)

196

25. Do you (Circle One):

1 — Do <i>all</i> searches yourself	4 — Do <i>most</i> searches through an intermediary (e.g. librarian)
2 — Do <i>most</i> searches yourself	5 — Do <i>all</i> searches through an intermediary
3 — Do <i>half</i> by yourself and half through an intermediary (e.g. librarian)	

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THIS DATA WILL BE USED TO DETERMINE WHETHER PEOPLE WITH DIFFERENT BACKGROUNDS HAVE DIFFERENT TECHNICAL COMMUNICATION PRACTICES.

26. What is your gender? 1 — Male 2 — Female

198

27. What is your level of education?

1 — No degree	3 — Masters	5 — Other _____
2 — Bachelors	4 — Doctorate	

199

28. How many years of professional work experience do you have? _____ Years

200
201

29. Type of organization where you work? (Circle Only One Number)

1 — Academic	4 — Government (Non-NASA)
2 — Industrial	5 — NASA
3 — Not-for-profit	6 — Other _____

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(OVER)

APPENDIX A

30. What are your present professional duties? (Circle Only *One* Number)

- | | | |
|---|--------------------------------|-----|
| 01 -- Research | 06 -- Manufacturing/Production | 303 |
| 02 -- Administration/Mgt. (for profit) | 07 -- Private Consultant | 304 |
| 03 -- Administration/Mgt. (not-for-profit sector) | 08 -- Service/Maintenance | |
| 04 -- Design/Development | 09 -- Marketing/Sales | |
| 05 -- Teaching/Academic | 10 -- Other _____ | |

31. What is your AIAA interest group? (Circle Only *One* Number)

- | | | |
|-----------------------------------|--|-----|
| 1 -- Aerospace Science | 5 -- Aerospace and Information Systems | 305 |
| 2 -- Aircraft Systems | 6 -- Administration/Management | |
| 3 -- Structures, Design, and Test | 7 -- Other _____ | |
| 4 -- Propulsion and Energy | | |

32. Is American English your first (native) language? 1 -- Yes 2 -- No 306

33. Are you an Engineer or a Scientist? 1 -- Engineer 2 -- Scientist 307

34. Are there comments you would like to add about topics covered in this questionnaire?

35. What can be done to improve technical communications in aeronautics?

Mail to: Dr. M. Glassman
 Dept. of Marketing
 Old Dominion University
 Norfolk, VA 23529-0213

APPENDIX B

AGGREGATE TOTALS

BLANK = 999

TECHNICAL COMMUNICATIONS IN AERONAUTICS

SKIP = 8

- v1** 1. In your work, how important is it for *YOU* to communicate technical information effectively?
- | | | | | |
|----------------------------|-------------------------------|--------------------------------|---------|----|
| <u>89.4</u> Very Important | <u>9.7</u> Somewhat Important | <u>.5</u> Not at all Important | 3 blank | .4 |
|----------------------------|-------------------------------|--------------------------------|---------|----|
- v2** 2. How many hours do *YOU* spend each week communicating technical information *TO* others? $\bar{x} = 13.95$ Hours
- v3** 3. How many hours do *YOU* spend each week working with technical communications *FROM* others? $\bar{x} = 12.57$ Hours
- v4** 4. As you have advanced professionally, how has the amount of time *YOU* spend communicating technical information *TO OTHERS* changed?
- | | | | | |
|-----------------------|-----------------------------|-----------------------|---------|----|
| <u>71.5</u> Increased | <u>15.3</u> Stayed the Same | <u>12.9</u> Decreased | 2 blank | .3 |
|-----------------------|-----------------------------|-----------------------|---------|----|
- v5** 5. As you have advanced professionally, how has the amount of time *YOU* spend working with technical communications received *FROM OTHERS* changed?
- | | | | | |
|-----------------------|-----------------------------|-----------------------|---------|-----|
| <u>60.6</u> Increased | <u>25.6</u> Stayed the Same | <u>12.7</u> Decreased | 7 blank | 1.1 |
|-----------------------|-----------------------------|-----------------------|---------|-----|
6. Approximately how many times in the past *six months* did you write/prepare: 995 = 1,000 times
- | | |
|---|---|
| v6 Letters $\bar{x} = 22.2$ times in the past 6 months | v13 Journal articles $\bar{x} = 0.4$ |
| v7 Memos $\bar{x} = 28.8$ | v14 Conference/Meeting papers $\bar{x} = 1.1$ |
| v8 Technical reports-Government $\bar{x} = 1.6$ | v15 Trade/Promotional literature $\bar{x} = 0.3$ |
| v9 Technical reports-Other $\bar{x} = 1.9$ | v16 Press releases $\bar{x} = 0.3$ |
| v10 Proposals $\bar{x} = 1.8$ | v17 Drawings/Specifications $\bar{x} = 3.2$ |
| v11 Technical manuals $\bar{x} = 0.3$ | v18 Speeches $\bar{x} = 2.2$ |
| v12 Computer program documentation $\bar{x} = 1.3$ | v19 Audio/Visual materials $\bar{x} = 6.6$ |
7. How many times in the past *one month* did you use materials written/prepared by other people?
- | | |
|---|---|
| v20 Letters $\bar{x} = 16.7$ # read/used in past 1 month | v27 Journal articles $\bar{x} = 6.7$ |
| v21 Memos $\bar{x} = 24.3$ | v28 Conference/Meeting papers $\bar{x} = 4.3$ |
| v22 Technical reports-Government $\bar{x} = 4.2$ | v29 Trade/Promotional literature $\bar{x} = 5.7$ |
| v23 Technical reports-Other $\bar{x} = 4.5$ | v30 Drawings/Specifications $\bar{x} = 7.9$ |
| v24 Proposals $\bar{x} = 1.4$ | v31 Audio/Visual materials $\bar{x} = 5.5$ |
| v25 Technical Manuals $\bar{x} = 2.2$ | |
| v26 Computer program documentation $\bar{x} = 3.0$ | |
8. When you write/prepare technical communications, do you receive help from:
- | | <i>Always</i> | <i>Usually</i> | <i>Sometimes</i> | <i>Never</i> | | |
|---|---------------|----------------|------------------|--------------|----------|-----|
| v32 Other colleagues | <u>11.7</u> | <u>39.6</u> | <u>45.4</u> | <u>2.6</u> | 4 blank | .7 |
| v33 Secretaries | <u>23.3</u> | <u>27.7</u> | <u>35.6</u> | <u>12.9</u> | 3 blank | .5 |
| v34 Technical writers or editors | <u>1.5</u> | <u>4.6</u> | <u>38.1</u> | <u>51.2</u> | 28 blank | 4.6 |
| v35 A thesaurus/dictionary | <u>21.0</u> | <u>28.7</u> | <u>41.1</u> | <u>7.4</u> | 11 blank | 1.8 |
| v36 A style manual | <u>1.5</u> | <u>4.5</u> | <u>33.8</u> | <u>55.4</u> | 29 blank | 4.8 |
| v37 A grammar hotline | <u>.2</u> | <u>.7</u> | <u>5.1</u> | <u>88.</u> | 37 blank | 6.0 |

APPENDIX B

9. Which of the following statements *BEST* represents how the artwork for *YOUR* visual aids (charts, graphs) is prepared? (Check Only One)

- 1 10.2 I do my own artwork without a computer
 2 34.0 I do my own artwork with a computer 6 blank 1.0
v38 3 16.5 The graphics department does my artwork
 4 30.0 Sometimes I do it and sometimes the graphics department does it
 5 6.3 A secretary does it
 6 2.0 The artwork is prepared elsewhere

10. Have you ever taken a course(s) in technical communications/writing? 0 skip

- v39** 24.4 Yes, as an Undergraduate 19.6 Yes, after graduation 24.6 Yes, both 31.4 No (Skip to Q. 12)

11. How well did this course help *YOU* communicate technical information?

- v40** 42.5 A Lot 54.1 A Little 2.7 Did not Help 4 blank .7

12. In your opinion, which of the following topics should be included in an undergraduate technical communications course for aeronautical engineers and scientists?

Yes	No	Principles		Yes	No	Mechanics	
v41 <u>90.3</u>	<u>9.2</u>	Defining the communication's purpose	3 blank .5	v51 <u>50.2</u>	<u>47.5</u>	Abbreviations	14 blank 2.3
v42 <u>80.9</u>	<u>18.1</u>	Assessing readers' needs	6 blank 1.0	v52 <u>48.7</u>	<u>49.2</u>	Acronyms	13 blank 2.1
v43 <u>96.0</u>	<u>3.5</u>	Organizing information	3 blank 0.5	v53 <u>59.6</u>	<u>38.1</u>	Capitalization	14 blank 2.3
v44 <u>85.8</u>	<u>13.7</u>	Developing paragraphs (introductions, transitions, and conclusions)	3 blank 0.5	v54 <u>47.2</u>	<u>49.7</u>	Numbers	19 blank 3.1
v45 <u>79.7</u>	<u>20.0</u>	Writing sentences (active vs. passive voice, parallel ideas, shifts in person or tense)	2 blank 0.3	v55 <u>74.3</u>	<u>23.6</u>	Punctuation	13 blank 2.1
v46 <u>77.4</u>	<u>22.1</u>	Using standard English grammar	3 blank 0.5	v56 <u>75.1</u>	<u>22.8</u>	References	13 blank 2.1
v47 <u>49.3</u>	<u>49.4</u>	Notetaking and quoting	8 blank 1.3	v57 <u>63.7</u>	<u>34.2</u>	Spelling	13 blank 2.1
v48 <u>77.4</u>	<u>22.1</u>	Editing and revising	3 blank 0.5	v58 <u>55.9</u>	<u>41.8</u>	Symbols	14 blank 2.3
v49 <u>81.0</u>	<u>18.5</u>	Choosing words (avoiding wordiness, jargon, slang, sexist terms)	3 blank 0.5				
v50 <u>60.3</u>	<u>38.9</u>	Using information technology (video conferencing, electronic data bases, etc.)	5 blank 0.8				

13. Which of the following on-the-job communications should be included in an undergraduate technical communications course for aeronautical engineers and scientists?

Yes	No			Yes	No	Reports:	
v59 <u>67.0</u>	<u>30.0</u>	Abstracts	18 blank 3.0	v70 <u>56.8</u>	<u>34.3</u>	Feasibility	54 blank 8.9
v60 <u>68.0</u>	<u>30.0</u>	Letters	12 blank 2.0	v71 <u>60.7</u>	<u>30.4</u>	Investigative	54 blank 8.9
v61 <u>76.4</u>	<u>21.8</u>	Memos	11 blank 1.8	v72 <u>64.7</u>	<u>26.6</u>	Laboratory	53 blank 8.7
v62 <u>56.1</u>	<u>41.3</u>	Instructions	16 blank 2.6	v73 <u>72.6</u>	<u>19.1</u>	Progress	50 blank 8.3
v63 <u>45.4</u>	<u>52.5</u>	Journal articles	13 blank 2.1	v74 <u>71.9</u>	<u>19.7</u>	Test	51 blank 8.4
v64 <u>36.3</u>	<u>61.1</u>	Literature reviews	16 blank 2.6	v75 <u>49.8</u>	<u>41.9</u>	Trip	50 blank 8.3
v65 <u>47.3</u>	<u>50.7</u>	Manuals	12 blank 2.0	v76 <u>46.5</u>	<u>44.9</u>	Trouble	52 blank 8.6
v66 <u>23.6</u>	<u>73.4</u>	Newsletter articles	18 blank 3.0				
v67 <u>93.6</u>	<u>4.6</u>	Oral presentations	11 blank 1.8				
v68 <u>54.5</u>	<u>43.2</u>	Specifications	14 blank 2.3				
v69 <u>77.2</u>	<u>20.5</u>	Use of information sources	14 blank 2.3				

14. Do *YOU* use computer technology to prepare technical communications? 52 skip

- v77** 38.3 Always 31.5 Usually 21.6 Sometimes 8.6 Never (Skip to Q. 19)

15. Has computer technology increased *YOUR* ability to communicate technical information?

- v78** 56.4 A Lot 30.2 A Little 4.8 Not at All 52 blank 8.6

APPENDIX B

16. Do *YOU* use any of the following software for preparing written technical communications?

Yes	No		52 skip 8.5	Yes	No		
v79 <u>85.8</u>	<u>5.1</u>	Word processing	3 blank .5	v83 <u>28.7</u>	<u>61.6</u>	Thesaurus	7 blank 1.2
v80 <u>9.7</u>	<u>80.2</u>	Outliners and prompters	9 blank 1.5	v84 <u>32.5</u>	<u>57.8</u>	Business graphics	7 blank 1.2
v81 <u>10.2</u>	<u>79.9</u>	Grammar and style checkers	8 blank 1.3	v85 <u>58.3</u>	<u>32.2</u>	Scientific graphics	6 blank 1.0
v82 <u>57.3</u>	<u>33.8</u>	Spelling checkers	2 blank .3				

17. Do *YOU* use an integrated graphics, text, and modeling engineering workstation for preparing written technical communications?

v86 <u>6.4</u>	Always	<u>10.1</u>	Usually	<u>24.6</u>	Sometimes	<u>49.2</u>	Never	52 skip 8.5
								7 blank 1.2

18. Do *YOU* use electronic or desk-top publishing systems for preparing written technical communications?

v87 <u>10.7</u>	Always	<u>18.5</u>	Usually	<u>24.3</u>	Sometimes	<u>37.0</u>	Never	52 skip 8.5
								6 blank 1.0

19. How do *YOU* view your use of the following information technologies in communicating technical information?

Information Technologies	<i>I already use it</i>	<i>I don't use it, but may in the future</i>	<i>I don't use it, and doubt if I will</i>		
v88 Audio tapes and cassettes	<u>19.5</u>	<u>28.4</u>	<u>48.2</u>	24 blank	3.9
v89 Motion picture film	<u>19.5</u>	<u>23.4</u>	<u>52.0</u>	31 blank	5.1
v90 Video tape	<u>45.4</u>	<u>38.6</u>	<u>13.5</u>	15 blank	2.5
v91 Desk-top/electronic publishing	<u>44.9</u>	<u>40.1</u>	<u>11.6</u>	21 blank	3.4
v92 Floppy disks	<u>72.8</u>	<u>18.5</u>	<u>6.4</u>	14 blank	2.3
v93 Computer cassette/cartridge tapes	<u>21.3</u>	<u>36.6</u>	<u>36.0</u>	37 blank	6.1
v94 Electronic mail	<u>45.3</u>	<u>42.1</u>	<u>9.7</u>	18 blank	2.9
v95 Electronic bulletin boards	<u>24.4</u>	<u>50.8</u>	<u>19.6</u>	31 blank	5.2
v96 FAX or TELEX	<u>82.7</u>	<u>10.6</u>	<u>4.8</u>	12 blank	1.9
v97 Electronic data bases	<u>47.9</u>	<u>38.4</u>	<u>8.9</u>	29 blank	4.8
v98 Video conferencing	<u>15.7</u>	<u>59.9</u>	<u>20.5</u>	24 blank	3.9
v99 Teleconferencing	<u>56.8</u>	<u>30.0</u>	<u>9.9</u>	20 blank	3.3
v100 Micrographics and microforms	<u>16.5</u>	<u>40.4</u>	<u>35.0</u>	49 blank	8.1
v101 Laser disc/video disc/CD-ROM	<u>5.8</u>	<u>61.1</u>	<u>27.2</u>	36 blank	5.9
v102 Electronic networks	<u>30.5</u>	<u>50.0</u>	<u>14.2</u>	32 blank	5.3

20. When faced with solving a technical problem, do you get technical information from:

	Always	Usually	Sometimes	Never		
v103 Personal knowledge	<u>42.5</u>	<u>45.5</u>	<u>11.2</u>	<u>1.0</u>	6 blank	0.8
v104 Informal discussions with colleagues	<u>19.8</u>	<u>36.8</u>	<u>22.3</u>	<u>.3</u>	5 blank	0.8
v105 Discussions with supervisors	<u>9.9</u>	<u>34.3</u>	<u>46.7</u>	<u>7.1</u>	12 blank	2.0
v106 Discussions with experts in your organization	<u>18.5</u>	<u>50.2</u>	<u>29.0</u>	<u>1.2</u>	7 blank	1.1
v107 Discussions with experts outside of your organization	<u>6.1</u>	<u>19.1</u>	<u>65.5</u>	<u>8.3</u>	6 blank	1.0
v108 Technical reports-Government	<u>5.8</u>	<u>27.4</u>	<u>59.9</u>	<u>5.9</u>	6 blank	1.0
v109 Technical reports-Other	<u>5.6</u>	<u>29.4</u>	<u>60.7</u>	<u>3.1</u>	7 blank	1.2
v110 Professional journals/conference meeting papers	<u>9.2</u>	<u>25.4</u>	<u>52.5</u>	<u>11.4</u>	9 blank	1.5
v111 Textbooks	<u>8.7</u>	<u>30.5</u>	<u>53.5</u>	<u>6.3</u>	6 blank	1.0
v112 Handbooks and standards	<u>6.6</u>	<u>27.1</u>	<u>54.6</u>	<u>9.4</u>	14 blank	2.3
v113 Technical information sources, such as on-line data bases, indexing and abstracting guides, CD-ROM, and current awareness tools	<u>1.2</u>	<u>6.8</u>	<u>43.2</u>	<u>45.4</u>	21 blank	3.4
v114 Librarians/technical information specialists	<u>2.6</u>	<u>11.2</u>	<u>65.0</u>	<u>19.6</u>	9 blank	1.6

APPENDIX B

21. What types of technical information do you *USE* in performing your present duties?

	Yes	No			
v115	96.4	3.0	Scientific and technical information	4 blank	0.6
v116	59.9	39.3	Experimental techniques	5 blank	0.8
v117	47.4	51.8	Codes of standards and practices	5 blank	0.8
v118	55.4	43.7	Design procedures and methods	5 blank	0.9
v119	80.2	19.1	Computer programs	4 blank	0.7
v120	71.3	27.9	Government rules and regulations	4 blank	0.8
v121	89.9	9.4	In-house technical data	5 blank	0.7
v122	71.8	27.6	Product and performance characteristics	4 blank	0.6
v123	35.5	63.7	Economic information	5 blank	0.8
v124	76.4	22.9	Technical specifications	4 blank	0.7
v125	14.0	85.3	Patents	4 blank	0.7

22. What types of technical information do you *PRODUCE* (or expect to produce) in performing your present duties?

	Yes	No			
v126	91.6	7.8	Scientific and technical information	4 blank	0.6
v127	44.4	55.0	Experimental techniques	4 blank	0.6
v128	20.8	78.5	Codes of standards and practices	4 blank	0.7
v129	46.5	52.5	Design procedures and methods	6 blank	1.0
v130	56.8	42.6	Computer programs	4 blank	0.6
v131	15.2	83.7	Government rules and regulations	7 blank	1.1
v132	84.3	15.0	In-house technical data	4 blank	0.7
v133	57.8	41.4	Product and performance characteristics	5 blank	0.8
v134	27.1	72.3	Economic information	4 blank	0.6
v135	59.2	40.1	Technical specifications	4 blank	0.7
v136	18.0	81.4	Patents	4 blank	0.6

23. How often do you use the library or a technical information center? (Circle Choice)

	1 <u>2.0</u> Daily	4 <u>19.1</u> Two to three times a month	
v137	2 <u>9.9</u> Two to six times a week	5 <u>16.8</u> Once a month	4 blank 0.7
	3 <u>14.9</u> Once a week	6 <u>30.7</u> Less than once a month	
		7 <u>5.9</u> Do not use	

v138 24. Do you use electronic data bases to find bibliographic citations and abstracts? 1 43.7 Yes 2 55.4 No (Skip to Q. 26)
5 blank 0.9

25. Do you (Circle One):

	1 <u>3.0</u> Do all searches yourself	4 <u>15.2</u> Do most searches through an intermediary (e.g. librarian)
v139	2 <u>6.9</u> Do most searches yourself	5 <u>12.7</u> Do all searches through an intermediary
	3 <u>5.3</u> Do half by yourself and half through an intermediary (e.g. librarian)	341 skip 56.3
		4 blank 0.6

THIS DATA WILL BE USED TO DETERMINE WHETHER PEOPLE WITH DIFFERENT BACKGROUNDS HAVE DIFFERENT TECHNICAL COMMUNICATION PRACTICES.

v140 26. What is your gender? 1 95.2 Male 2 4.8 Female

27. What is your level of education?

	1 <u>0.7</u> No degree	3 <u>43.6</u> Masters	5 <u>0.4</u> Other	
v141	2 <u>32.7</u> Bachelors	4 <u>22.6</u> Doctorate		

v142 28. How many years of professional work experience do you have? _____ Years

1-5	17.7	26-30	77.4
6-10	35.0	31-35	88.6
11-15	44.7	36-40	96.7
16-20	54.1	41-45	99.0
21-25	63.2	46-99	100.0

29. Type of organization where you work? (Circle Only One Number)

	1 <u>6.8</u> Academic	4 <u>16.0</u> Government (Non-NASA)
v143	2 <u>62.0</u> Industrial	5 <u>12.2</u> NASA
	3 <u>2.8</u> Not-for-profit	6 <u>.2</u> Other

APPENDIX B

30. What are your present professional duties? (Circle Only *One* Number)

- | | |
|--|---|
| 01 <u>19.5</u> Research | 06 <u>1.7</u> Manufacturing/Production |
| 02 <u>15.3</u> Administration/Mgt. (for profit) | 07 <u>2.3</u> Private Consultant |
| v144 03 <u>8.4</u> Administration/Mgt. (not-for-profit sector) | 08 <u>.2</u> Service/Maintenance 2 blank 0.3 |
| 04 <u>37.3</u> Design/Development | 09 <u>3.8</u> Marketing/Sales |
| 05 <u>5.8</u> Teaching/Academic | 10 <u>5.4</u> Other _____ |

31. What is your AIAA interest group? (Circle Only *One* Number)

- | | |
|--|---|
| 1 <u>30.2</u> Aerospace Science | 5 <u>7.9</u> Aerospace and Information Systems |
| v145 2 <u>13.5</u> Aircraft Systems | 6 <u>6.2</u> Administration/Management 8 blank 1.3 |
| 3 <u>13.5</u> Structures, Design, and Test | 7 <u>7.6</u> Other _____ |
| 4 <u>19.8</u> Propulsion and Energy | |

v146 32. Is American English your first (native) language? 1 93.6 Yes 2 6.4 No

v147 33. Are you an Engineer or a Scientist? 1 89.2 Engineer 2 10.1 Scientist 4 blank 0.7

34. Are there comments you would like to add about topics covered in this questionnaire?

35. What can be done to improve technical communications in aeronautics?

Mail to: Dr. M. Glassman
 Dept. of Marketing
 Old Dominion University
 Norfolk, VA 23529-0218

APPENDIX C
CROSS TABULATIONS
PART A

Significant at $P < .05$ with no more than 20% expected values less than 5

SPSS/PC+

Crosstabulation: V32 RECEIVE HELP FROM COLLEAGUES

V143-)	Count Col Pct	ACADEMIC INDUS- GOVT INASA				Row Total
		1	2	4	5	
V32						
ALWAYS	1	4	39	12	13	68
		7.0	10.4	12.4	17.8	11.3
USUALLY	2	16	162	36	25	239
		28.1	43.3	37.1	34.2	39.8
SOMETIMES	3	30	164	49	35	278
		52.6	43.9	50.5	47.9	46.3
NEVER	4	7	9			16
		12.3	2.4			2.7
Column Total		57	374	97	73	601
		9.5	62.2	16.1	12.1	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
33.70301	9	.0001	1.517	3 OF 16 (18.8%)

Number of Missing Observations = 5

SPSS/PC+

Crosstabulation: V33 HELP FROM SECRETARIES

V143-)	Count Col Pct	ACADEMIC INDUS- GOVT INASA				Row Total
		1	2	4	5	
V33						
ALWAYS	1	13	103	11	14	141
		22.8	27.5	11.3	18.9	23.4
USUALLY	2	13	103	35	17	168
		22.8	27.5	36.1	23.0	27.9
SOMETIMES	3	24	122	35	34	215
		42.1	32.6	36.1	45.9	35.7
NEVER	4	7	46	16	9	78
		12.3	12.3	16.5	12.2	13.0
Column Total		57	374	97	74	602
		9.5	62.1	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
17.86622	9	.0368	7.385	None

Number of Missing Observations = 4

APPENDIX C
SPSS/PC+

Crosstabulation: V39 EVER TAKEN A TECH COMM COURSE

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V39						
	1	15	91	28	13	147
YES, UNDERGRADUA		25.9	24.2	28.9	17.6	24.3
	2	9	74	16	20	119
YES, AFTER GRADU		15.5	19.7	16.5	27.0	19.7
	3	5	99	28	17	149
YES, BOTH		8.6	26.3	28.9	23.0	24.6
	4	29	112	25	24	190
NO		50.0	29.8	25.8	32.4	31.4
	Column Total	58	376	97	74	605
		9.6	62.1	16.0	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
20.28448	9	.0162	11.408	None

Number of Missing Observations = 1

SPSS/PC+

Crosstabulation: V59 ABSTRACTS

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V59						
	1	49	234	68	55	406
YES		87.5	63.8	73.9	76.4	69.2
	2	7	133	24	17	181
NO		12.5	36.2	26.1	23.6	30.8
	Column Total	56	367	92	72	587
		9.5	62.5	15.7	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
16.58825	3	.0009	17.267	None

Number of Missing Observations = 19

APPENDIX C

SPSS/PC+

Crosstabulation: V62 INSTRUCTIONS

V143->	Count		ACADEMIC	INDUS-	GOVT	NASA	Row Total
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	
V62							
	1		35	217	58	29	339
YES			61.4	59.5	60.4	40.8	57.6
	2		22	148	38	42	250
NO			38.6	40.5	39.6	59.2	42.4
	Column Total		57	365	96	71	589
			9.7	62.0	16.3	12.1	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.32028	3	.0253	24.194	None

Number of Missing Observations = 17

SPSS/PC+

Crosstabulation: V63 JOURNAL ARTICLES

V143->	Count		ACADEMIC	INDUS-	GOVT	NASA	Row Total
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	
V63							
	1		40	145	44	46	275
YES			70.2	39.4	46.3	63.9	46.5
	2		17	223		26	317
NO			29.8	60.6	53.7	36.1	53.5
	Column Total		57	368	95	72	592
			9.6	62.2	16.0	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
29.05115	3	.0000	26.478	None

Number of Missing Observations = 14

APPENDIX C

SPSS/PC+

Crosstabulation: V68 SPECIFICATIONS

V143->	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
	1		1	2	4	5	Total
V68							
YES	1		24	219	53	33	329
			42.1	59.7	55.8	45.8	55.7
NO	2		33	148	42	39	262
			57.9	40.3	44.2	54.2	44.3
Column Total			57	367	95	72	591
			9.6	62.1	16.1	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.45637	3	.0238	25.269	None

Number of Missing Observations = 15

SPSS/PC+

Crosstabulation: V69 USE OF INFO SOURCES

V143->	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
	1		1	2	4	5	Total
V69							
YES	1		43	301	77	47	468
			75.4	82.0	80.2	66.2	79.2
NO	2		14	66	19	24	123
			24.6	18.0	19.8	33.8	20.8
Column Total			57	367	96	71	591
			9.6	62.1	16.2	12.0	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.59858	3	.0223	11.863	None

Number of Missing Observations = 15

APPENDIX C

SPSS/PC+

Crosstabulation: V70 FEASIBILITY REPORTS

V143-)	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROFIT	RIAL			
			1	2	4	5	Total
V70							
YES	1		20	223	60	40	343
			41.7	64.5	64.5	62.5	62.3
NO	2		28	123	33	24	208
			58.3	35.5	35.5	37.5	37.7
Column Total			48	346	93	64	551
			8.7	62.8	16.9	11.6	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.57217	3	.0226	18.120	None

Number of Missing Observations = 55

SPSS/PC+

Crosstabulation: V75 TRIP REPORTS

V143-)	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROFIT	RIAL			
			1	2	4	5	Total
V75							
YES	1		20	195	59	27	301
			41.7	56.0	62.8	41.5	54.2
NO	2		28	153	35	38	254
			58.3	44.0	37.2	58.5	45.8
Column Total			48	348	94	65	555
			8.6	62.7	16.9	11.7	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
10.48652	3	.0149	21.968	None

Number of Missing Observations = 51

APPENDIX C
SPSS/PC+

Crosstabulation: V77 USE COMPUTER TECHNOLOGY

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V77							
ALWAYS	1		25	120	42	44	231
			43.1	31.9	43.3	59.5	38.2
USUALLY	2		14	127	35	15	191
			24.1	33.8	36.1	20.3	31.6
SOMETIMES	3		13	91	16	11	131
			22.4	24.2	16.5	14.9	21.7
NEVER	4		6	38	4	4	52
			10.3	10.1	4.1	5.4	8.6
	Column		58	376	97	74	605
	Total		9.6	62.1	16.0	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
27.13709	9	.0013	4.985	1 OF 16 (6.3%)

Number of Missing Observations = 1

SPSS/PC+

Crosstabulation: V82 SPELLING CHECKERS

V143-)	Count	ACADEMIC	INDUS-	GOVT	INASA	Row
	Col Pct	NON-PROFIT	TRIAL			
		1	2	4	5	Total
V82						
YES	1	28	201	66	51	346
		54.9	59.6	71.0	72.9	62.8
NO	2	23	136	27	19	205
		45.1	40.4	29.0	27.1	37.2
	Column	51	337	93	70	551
	Total	9.3	61.2	16.9	12.7	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
8.48464	3	.0370	18.975	None

Number of Missing Observations = 55

APPENDIX C
SPSS/PC+

Crosstabulation: V83 THESAURUS

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	RIAL			
			1	2	4	5	Total
V83							
	1		12	107	39	16	174
YES			23.5	32.0	42.4	23.2	31.9
	2		39	227	53	53	372
NO			76.5	68.0	57.6	76.8	68.1
	Column		51	334	92	69	546
	Total		9.3	61.2	16.8	12.6	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
8.72396	3	.0332	16.253	None

Number of Missing Observations = 60

SPSS/PC+

Crosstabulation: V85 SCIENTIFIC GRAPHICS

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	RIAL			
			1	2	4	5	Total
V85							
	1		35	208	54	56	353
YES			67.3	62.5	58.7	80.0	64.5
	2		17	125	38	14	194
NO			32.7	37.5	41.3	20.0	35.5
	Column		52	333	92	70	547
	Total		9.5	60.9	16.8	12.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.48492	3	.0235	18.442	None

Number of Missing Observations = 59

APPENDIX C

SPSS/PC+

Crosstabulation: V86 USE AN INTEGRATED GRAPHICS TEXT

V143-)	Count Col Pct	ACADEMIC/INDUS- IGOVT INASA I				Row Total
		NON-PROFITRIAL	I	I	I	
		1	2	4	5	
V86						
	1	2	18	7	12	39
ALWAYS		3.8	5.4	7.6	17.6	7.1
	2	5	33	11	12	61
USUALLY		9.6	9.9	12.0	17.6	11.2
	3	14	94	25	15	148
SOMETIMES		26.9	28.1	27.2	22.1	27.1
	4	31	189	49	29	298
NEVER		59.6	56.6	53.3	42.6	54.6
	Column Total	52	334	92	68	546
		9.5	61.2	16.8	12.5	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
19.03954	9	.0249	3.714	2 OF 16 (12.5%)

Number of Missing Observations = 60

SPSS/PC+

Crosstabulation: V89 MOTION PICTURE FILM

V143-)	Count Col Pct	ACADEMIC/INDUS- IGOVT INASA I				Row Total
		NON-PROFITRIAL	I	I	I	
		1	2	4	5	
V89						
	1	16	56	26	20	118
ALREADY USE IT		29.1	15.8	28.0	28.2	20.6
	2	17	90	19	16	142
DON'T BUT MAY		30.9	25.4	20.4	22.5	24.7
	3	22	209	48	35	314
DOUBT IF I WILL		40.0	58.9	51.6	49.3	54.7
	Column Total	55	355	93	71	574
		9.6	61.8	16.2	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
15.95798	6	.0140	11.307	None

Number of Missing Observations = 32

APPENDIX C
SPSS/PC+

Crosstabulation: V91 DESK-TOP/ELECTRONIC PUBLISHING

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT INASA				Row Total
		NON-PROFITRIAL				
		1	2	4	5	
V91						
	1	20	165	44	43	272
ALREADY USE IT		35.7	45.2	46.8	62.3	46.6
	2	25	155	42	20	242
DON'T BUT MAY		44.6	42.5	44.7	29.0	41.4
	3	11	45	8	6	70
DOUBT IF I WILL		19.6	12.3	8.5	8.7	12.0
	Column Total	56	365	94	69	584
		9.6	62.5	16.1	11.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
12.63612	6	.0492	6.712	None

Number of Missing Observations = 22

SPSS/PC+

Crosstabulation: V94 ELECTRONIC MAIL

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT INASA				Row Total
		NON-PROFITRIAL				
		1	2	4	5	
V94						
	1	27	147	46	53	273
ALREADY USE IT		49.1	40.4	48.4	72.6	46.5
	2	22	176	41	16	255
DON'T BUT MAY		40.0	48.4	43.2	21.9	43.4
	3	6	41	8	4	59
DOUBT IF I WILL		10.9	11.3	8.4	5.5	10.1
	Column Total	55	364	95	73	587
		9.4	62.0	16.2	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
26.07522	6	.0002	5.528	None

Number of Missing Observations = 19

APPENDIX C

SPSS/PC+

Crosstabulation: V95 ELECTRONIC BULLETIN BOARDS

V143-)	Count Col Pct	ACADEMIC NON-PROFIT	INDUS- TRIAL	GOVT	NASA	Row Total
		1	2	4	5	
V95		1	1	2	4	5
ALREADY USE IT	1	14	67	26	41	148
		26.4	18.8	27.7	57.7	25.8
DON'T BUT MAY	2	28	207	48	24	307
		52.8	58.1	51.1	33.8	53.5
DOUBT IF I WILL	3	11	82	20	6	119
		20.8	23.0	21.3	8.5	20.7
Column Total		53	356	94	71	574
		9.2	62.0	16.4	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
47.74792	6	.0000	10.988	None

Number of Missing Observations = 32

SPSS/PC+

Crosstabulation: V97 ELECTRONIC DATA BASES

V143-)	Count Col Pct	ACADEMIC NON-PROFIT	INDUS- TRIAL	GOVT	NASA	Row Total
		1	2	4	5	
V97		1	1	2	4	5
ALREADY USE IT	1	16	195	45	33	289
		29.6	54.6	47.9	46.5	50.2
DON'T BUT MAY	2	33	129	40	31	233
		61.1	36.1	42.6	43.7	40.5
DOUBT IF I WILL	3	5	33	9	7	54
		9.3	9.2	9.6	9.9	9.4
Column Total		54	357	94	71	576
		9.4	62.0	16.3	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
13.89788	6	.0308	5.063	None

Number of Missing Observations = 30

APPENDIX C

SPSS/PC+

Crosstabulation: V98 VIDEO CONFERENCING

	Count	ACADEMIC	INDUS-	GOVT	INASA	
V143->	Col Pct	NON-PROFIT	TRIAL			Row
		1	2	4	5	Total
V98						
1		3	59	9	23	94
ALREADY USE IT		5.6	16.4	9.5	31.9	16.2
2		30	231	59	43	363
DON'T BUT MAY		55.6	64.2	62.1	59.7	62.5
3		21	70	27	6	124
DOUBT IF I WILL		38.9	19.4	28.4	8.3	21.3
Column		54	360	95	72	581
Total		9.3	62.0	16.4	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
34.48282	6	.0000	8.737	None

Number of Missing Observations = 25

SPSS/PC+

Crosstabulation: V99 TELECONFERENCING

	Count	ACADEMIC	INDUS-	GOVT	INASA	
V143->	Col Pct	NON-PROFIT	TRIAL			Row
		1	2	4	5	Total
V99						
1		19	227	46	51	343
ALREADY USE IT		33.9	62.5	48.4	71.8	58.6
2		27	103	36	16	182
DON'T BUT MAY		48.2	28.4	37.9	22.5	31.1
3		10	33	13	4	60
DOUBT IF I WILL		17.9	9.1	13.7	5.6	10.3
Column		56	363	95	71	585
Total		9.6	62.1	16.2	12.1	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
25.99568	6	.0002	5.744	None

Number of Missing Observations = 21

APPENDIX C

SPSS/PC+

Crosstabulation: V102 ELECTRONIC NETWORKS

	Count	ACADEMIC	INDUS-	GOVT	INASA	
V143-)	Col Pct	NON-PROFIT	TRIAL			Row
		1	2	4	5	Total
V102		-----	-----	-----	-----	-----
	1	16	98	30	40	184
ALREADY USE IT		29.6	27.6	32.3	56.3	32.1
		-----	-----	-----	-----	-----
	2	28	203	48	24	303
DON'T BUT MAY		51.9	57.2	51.6	33.8	52.9
		-----	-----	-----	-----	-----
	3	10	54	15	7	86
DOUBT IF I WILL		18.5	15.2	16.1	9.9	15.0
		-----	-----	-----	-----	-----
	Column	54	355	93	71	573
	Total	9.4	62.0	16.2	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
23.27959	6	.0007	8.105	None

Number of Missing Observations = 33

SPSS/PC+

Crosstabulation: V105 DISCUSSIONS WITH SUPERVISORS

V143-)	Count	ACADEMIC	INDUS-	GOVT	INASA	Row
	Col Pct	NON-PROFIT	TRIAL			
		1	2	4	5	
V105		-----	-----	-----	-----	-----
	1	2	40	10	8	60
ALWAYS		3.6	10.9	10.3	11.0	10.1
		-----	-----	-----	-----	-----
	2	14	139	31	24	208
USUALLY		25.5	37.8	32.0	32.9	35.1
		-----	-----	-----	-----	-----
	3	23	169	51	39	282
SOMETIMES		41.8	45.9	52.6	53.4	47.6
		-----	-----	-----	-----	-----
	4	16	20	5	2	43
NEVER		29.1	5.4	5.2	2.7	7.3
		-----	-----	-----	-----	-----
	Column	55	368	97	73	593
	Total	9.3	62.1	16.4	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
47.24618	9	.0000	3.988	1 OF 16 (6.3%)

Number of Missing Observations = 13

APPENDIX C

SPSS/PC+

Crosstabulation: V110 JOURNAL/MEETING PAPERS

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V110						
ALWAYS	1	10	18	13	14	55
		17.5	4.9	13.5	19.2	9.2
USUALLY	2	23	85	21	25	154
		40.4	23.0	21.9	34.2	25.8
SOMETIMES	3	24	216	50	28	318
		42.1	58.4	52.1	38.4	53.4
NEVER	4		51	12	6	69
			13.8	12.5	8.2	11.6
Column Total		57	370	96	73	596
		9.6	62.1	16.1	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
45.22013	9	.0000	5.260	None

Number of Missing Observations = 10

SPSS/PC+

Crosstabulation: V111 TEXTBOOKS

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V111						
ALWAYS	1	8	24	10	11	53
		14.3	6.5	10.3	14.9	8.8
USUALLY	2	26	104	30	24	184
		46.4	28.0	30.9	32.4	30.7
SOMETIMES	3	21	217	52	34	324
		37.5	58.3	53.6	45.9	54.1
NEVER	4	1	27	5	5	38
		1.8	7.3	5.2	6.8	6.3
Column Total		56	372	97	74	599
		9.3	62.1	16.2	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
20.60234	9	.0145	3.553	3 DF 16 (18.8%)

Number of Missing Observations = 7

APPENDIX C

SPSS/PC+

Crosstabulation: V114 LIBRARIANS/TECH INFO SPECIALISTS

V143-)	Count Col Pct	ACADEMIC/INDUS- NON-PROFIT/IAL				GOVT INASA				Row Total
		1	2	3	4	5	6	7	8	
V114										
ALWAYS	1	1	10	4	1	16				
		1.8	2.7	4.1	1.4	2.7				
USUALLY	2	4	40	7	17	68				
		7.3	10.8	7.2	23.0	11.4				
SOMETIMES	3	45	238	68	42	393				
		81.8	64.3	70.1	56.8	65.9				
NEVER	4	5	82	18	14	119				
		9.1	22.2	18.6	18.9	20.0				
Column Total		55	370	97	74	596				
		9.2	62.1	16.3	12.4	100.0				

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
20.24043	9	.0165	1.477	3 OF 16 (18.8%)

Number of Missing Observations = 10

SPSS/PC+

Crosstabulation: V117 CODES OF STANDARD AND PRACTICES

V143-)	Count Col Pct	ACADEMIC/INDUS- NON-PROFIT/IAL				GOVT INASA				Row Total
		1	2	3	4	5	6	7	8	
V117										
YES	1	15	200	42	30	287				
		25.9	53.8	43.3	40.5	47.8				
NO	2	43	172	55	44	314				
		74.1	46.2	56.7	59.5	52.2				
Column Total		58	372	97	74	601				
		9.7	61.9	16.1	12.3	100.0				

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
18.84074	3	.0003	27.697	None

Number of Missing Observations = 5

APPENDIX C

SPSS/PC+

Crosstabulation: V118 DESIGN PROCEDURES

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row Total
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	
V118							
	1		20	232	50	34	336
YES			34.5	62.4	51.5	45.9	55.9
	2		38	140	47	40	265
NO			65.5	37.6	48.5	54.1	44.1
	Column Total		58	372	97	74	601
			9.7	61.9	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
20.82106	3	.0001	25.574	None

Number of Missing Observations = 5

SPSS/PC+

Crosstabulation: V120 GOVT RULES AND REGULATIONS

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row Total
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	
V120							
	1		20	275	81	56	432
YES			34.5	73.7	84.4	75.7	71.9
	2		38	98	15	18	169
NO			65.5	26.3	15.6	24.3	28.1
	Column Total		58	373	96	74	601
			9.7	62.1	16.0	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
48.70339	3	.0000	16.309	None

Number of Missing Observations = 5

APPENDIX C
SPSS/PC+

Crosstabulation: V121 IN-HOUSE TECH DATA

V143-)	Count	ACADEMIC	INDUS-	GOVT	NASA	Row Total
	Col Pct	NON-PROFIT	RIAL			
		1	2	4	5	
V121						
	1	36	354	89	66	545
YES		62.1	94.9	91.8	89.2	90.5
	2	22	19	8	8	57
NO		37.9	5.1	8.2	10.8	9.5
	Column Total	58	373	97	74	602
		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
63.46654	3	.0000	5.492	None

Number of Missing Observations = 4

SPSS/PC+

Crosstabulation: V122 PRODUCT AND PERFORMANCE CHARACTERISTICS

V143-)	Count	ACADEMIC	INDUS-	GOVT	NASA	Row Total
	Col Pct	NON-PROFIT	RIAL			
		1	2	4	5	
V122						
	1	28	294	71	42	435
YES		48.3	78.8	73.2	56.8	72.3
	2	30	79	26	32	167
NO		51.7	21.2	26.8	43.2	27.7
	Column Total	58	373	97	74	602
		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
33.56801	3	.0000	16.090	None

Number of Missing Observations = 4

APPENDIX C

SPSS/PC+

Crosstabulation: V123 ECONOMIC INFORMATION

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row Total
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	
V123							
YES	1		18	151	28	18	215
			31.0	40.6	28.9	24.3	35.8
NO	2		40	221	69	56	386
			69.0	59.4	71.1	75.7	64.2
Column Total			58	372	97	74	601
			9.7	61.9	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
10.56137	3	.0144	20.749	None

Number of Missing Observations = 5

SPSS/PC+

Crosstabulation: V124 TECHNICAL SPECIFICATIONS

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row Total
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	
V124							
YES	1		32	311	73	47	463
			55.2	83.4	75.3	63.5	76.9
NO	2		26	62	24	27	139
			44.8	16.6	24.7	36.5	23.1
Column Total			58	373	97	74	602
			9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
31.84762	3	.0000	13.392	None

Number of Missing Observations = 4

APPENDIX C

SPSS/PC+

Crosstabulation: V125 PATENTS

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT NASA				Row Total
		NON-PROFIT	INDUS-TRIAL	GOVT	NASA	
		1	2	4	5	
V125		-----+				
YES	1	4	66	9	6	85
		6.9	17.7	9.3	8.1	14.1
		-----+				
NO	2	54	307	88	68	517
		93.1	82.3	90.7	91.9	85.9
		-----+				
	Column Total	58	373	97	74	602
		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
10.50657	3	.0147	8.189	None

Number of Missing Observations = 4

SPSS/PC+

Crosstabulation: V127 EXPERIMENTAL TECHNIQUES

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT NASA				Row Total
		NON-PROFIT	INDUS-TRIAL	GOVT	NASA	
		1	2	4	5	
V127		-----+				
YES	1	33	155	40	41	269
		56.9	41.6	41.2	55.4	44.7
		-----+				
NO	2	25	218	57	33	333
		43.1	58.4	58.8	44.6	55.3
		-----+				
	Column Total	58	373	97	74	602
		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
8.88488	3	.0309	25.917	None

Number of Missing Observations = 4

APPENDIX C

SPSS/PC+

Crosstabulation: V128 CODES OF STANDARDS AND PRACTICES

V143-)	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROF	TRIAL			
			1	2	4	5	Total
V128							
	1		6	82	27	11	126
YES			10.3	22.0	27.8	14.9	20.9
	2		52	291	70	63	476
NO			89.7	78.0	72.2	85.1	79.1
	Column		58	373	97	74	602
	Total		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
8.61661	3	.0348	12.140	None

Number of Missing Observations = 4

SPSS/PC+

Crosstabulation: V131 GOVT RULES AND REGULATIONS

V143-)	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROF	TRIAL			
			1	2	4	5	Total
V131							
	1		5	15	52	20	92
YES			8.6	4.0	54.2	27.0	15.4
	2		53	356	44	54	507
NO			91.4	96.0	45.8	73.0	84.6
	Column		58	371	96	74	599
	Total		9.7	61.9	16.0	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
157.53396	3	.0000	8.908	None

Number of Missing Observations = 7

APPENDIX C

SPSS/PC+

Crosstabulation: V132 IN-HOUSE TECH DATA

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V132						
YES	1	36	329	84	62	511
		62.1	88.2	86.6	83.8	84.9
NO	2	22	44	13	12	91
		37.9	11.8	13.4	16.2	15.1
Column Total		58	373	97	74	602
		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
27.02444	3	.0000	8.767	None

Number of Missing Observations = 4

SPSS/PC+

Crosstabulation: V133 PRODUCT AND PERFORMANCE CHARACTERISTICS

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V133						
YES	1	19	251	51	29	350
		32.8	67.3	53.1	39.2	58.2
NO	2	39	122	45	45	251
		67.2	32.7	46.9	60.8	41.8
Column Total		58	373	96	74	601
		9.7	62.1	16.0	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
40.12593	3	.0000	24.223	None

Number of Missing Observations = 5

APPENDIX C

SPSS/PC+

Crosstabulation: V134 ECONOMIC INFORMATION

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143-)	Col Pct	NON-PROFIT	TRIAL			Row
		1	2	4	5	Total
V134		-----+	-----+	-----+	-----+	
	1	10	117	24	13	164
YES		17.2	31.4	24.7	17.6	27.2
		-----+	-----+	-----+	-----+	
	2	48	256	73	61	438
NO		82.8	68.6	75.3	82.4	72.8
		-----+	-----+	-----+	-----+	
	Column	58	373	97	74	602
	Total	9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
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9.92916	3	.0192	15.801	None
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Number of Missing Observations = 4

SPSS/PC+

Crosstabulation: V135 TECHNICAL SPECIFICATIONS

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143->	Col Pct	NON-PROFIT	TRIAL			Row
		1	2	4	5	Total
V135						
	1	23	248	49	39	359
YES		39.7	66.5	50.5	52.7	59.6
	2	35	125	48	35	243
NO		60.3	33.5	49.5	47.3	40.4
	Column	58	373	97	74	602
	Total	9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
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21.72406	3	.0001	23.412	None
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Number of Missing Observations = 4

APPENDIX C

SPSS/PC+

Crosstapulation: V138 USE ELECTRONIC DATA BASES TO FIND CITATI

V143->	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V138							
	1		36	144	40	45	265
YES			62.1	38.7	41.2	60.8	+4.1
	2		22	228	57	29	336
NO			37.9	61.3	58.8	39.2	55.9
	Column		58	372	97	74	601
	Total		9.7	61.9	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
20.68692	3	.0001	25.574	None

Number of Missing Observations = 5

APPENDIX C
CROSS TABULATIONS
PART B

Not statistically significant at $P < .05$

SPSS/PC+

Crosstabulation: V1 IMPORTANCE OF COMMUNICATING TECH INFO IN

V143-)	Count	ACADEMIC	INDUS-	GOVT	INASA	Row Total
	Col Pct	NON-PROFIT	RIAL			
		1	2	4	5	
V1						
	1	54	337	83	67	541
VERY IMPORTANT		93.1	89.9	85.6	91.8	89.7
	2	3	38	13	5	59
SOMEWHAT IMPORTA		5.2	10.1	13.4	6.8	9.8
	3	1		1	1	3
NOT AT ALL IMPOR		1.7		1.0	1.4	.5
	Column Total	58 9.6	375 62.2	97 16.1	73 12.1	603 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
8.83476	6	.1831	.289	4 OF 12 (33.3%)

Number of Missing Observations = 3

SPSS/PC+

Crosstabulation: V2 HOURS/WEEK COMMUNICATING TO OTHER

V143-)	Count Col Pct	ACADEMIC NON-PROFIT	INDUS- TRIAL	GOVT	INASA	Row Total
		1	2	4	5	
V2						
5	5	10	58	18	16	102
5 hrs or less		17.2	15.7	18.8	22.2	17.1
10	10	12	125	26	26	189
6 to 10 hrs		20.7	33.9	27.1	36.1	31.8
20	20	29	144	40	23	236
11 to 20 hrs		50.0	39.0	41.7	31.9	39.7
21	21	7	42	12	7	68
21 hrs or more		12.1	11.4	12.5	9.7	11.4
Column Total		58 9.7	369 62.0	96 16.1	72 12.1	595 100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
8.59357	9	.4756	6.629	None

Number of Missing Observations = 11

APPENDIX C

SPSS/PC+

Crosstabulation: V3 HOURS/WEEK WITH COMMUNICATIONS FROM OTHE

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT INASA				Row Total
		NON-PROFITRIAL 1	2	4	5	
V3						
5 hrs or less	5	15	76	21	14	126
		25.9	20.5	21.9	19.4	21.1
6 to 10 hrs	10	20	140	30	31	221
		34.5	37.8	31.3	43.1	37.1
11 to 20 hrs	20	19	127	30	21	197
		32.8	34.3	31.3	29.2	33.1
21 hrs or more	21	4	27	15	6	52
		6.9	7.3	15.6	8.3	8.7
Column Total		58	370	96	72	596
		9.7	62.1	16.1	12.1	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
9.47693	9	.3945	5.060	None

Number of Missing Observations = 10

SPSS/PC+

Crosstabulation: V4 CHANGE IN COMM TO OTHERS

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT INASA				Row Total
		NON-PROFITRIAL 1	2	4	5	
V4						
INCREASED	1	45	264	66	57	432
		77.6	70.6	68.0	77.0	71.6
STAYED THE SAME	2	10	56	15	12	93
		17.2	15.0	15.5	16.2	15.4
DECREASED	3	3	54	16	5	78
		5.2	14.4	16.5	6.8	12.9
Column Total		58	374	97	74	603
		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.51219	6	.2761	7.502	None

Number of Missing Observations = 3

APPENDIX C

SPSS/PC+

Crosstabulation: V5 CHANGE IN COMM WITH OTHERS

V143-)	Count Col Pct	ACADEMIC/INDUS- NON-PROFITRIAL	GOVT	INASA		Row Total
V5		1	2	4	5	
INCREASED	1	34	225	57	50	366
		59.6	60.6	59.4	67.6	61.2
STAYED THE SAME	2	18	92	25	20	155
		31.6	24.8	26.0	27.0	25.9
DECREASED	3	5	54	14	4	77
		8.8	14.6	14.6	5.4	12.9
Column Total		57	371	96	74	598
		9.5	62.0	16.1	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.48625	6	.3710	7.339	None

Number of Missing Observations = 8

SPSS/PC+

Crosstabulation: V34 HELP FROM TECH WRITERS

	Count	ACADEMIC/INDUS-		GOVT		INASA		
V143-)	Col Pct	NON-PROFITRIAL						Row
		1	2	4	5			Total
V34		-----+						
ALWAYS	1	1	3	2	3			9
		1.9	.8	2.1	4.3			1.6
USUALLY	2	1	15	6	6			28
		1.9	4.2	6.4	8.7			4.9
SOMETIMES	3	17	148	31	35			231
		31.5	41.1	33.0	50.7			40.0
NEVER	4	35	194	55	25			309
		64.8	53.9	58.5	36.2			53.6
		-----+						
	Column	54	360	94	69			577
	Total	9.4	62.4	16.3	12.0			100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
18.59815	9	.0288	.842	6 OF 16 (37.5%)

Number of Missing Observations = 29

APPENDIX C
SPSS/PC+

Crosstabulation: V35 HELP FROM THESAURUS/Dictionary

V143-)	Count Col Pct	ACADEMICINDUS-IGOVNINASA				Row Total
		1	2	4	5	
V35						
ALWAYS	1	13	67	27	20	127
		23.2	18.1	27.8	28.2	21.4
USUALLY	2	10	117	25	22	174
		17.9	31.6	25.8	31.0	29.3
SOMETIMES	3	27	152	42	27	248
		48.2	41.1	43.3	38.0	41.8
NEVER	4	6	34	3	2	45
		10.7	9.2	3.1	2.8	7.6
Column Total		56	370	97	71	594
		9.4	62.3	16.3	12.0	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5	
16.61311	9	.0551	4.242	1 OF	16 (6.3%)

Number of Missing Observations = 12

SPSS/PC+

Crosstabulation: V36 HELP FROM STYLE MANUAL

V143-)	Count Col Pct	ACADEMICINDUS-IGOVNINASA				Row Total
		1	2	4	5	
V36						
ALWAYS	1	1	6		2	9
		1.9	1.7		3.0	1.6
USUALLY	2	1	15	7	4	27
		1.9	4.2	7.4	6.0	4.7
SOMETIMES	3	21	124	40	20	205
		38.9	34.3	42.6	29.9	35.6
NEVER	4	31	216	47	41	335
		57.4	59.8	50.0	61.2	58.2
Column Total		54	361	94	67	576
		9.4	62.7	16.3	11.6	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5	
8.87830	9	.4486	.844	6 OF	16 (37.5%)

Number of Missing Observations = 30

APPENDIX C

SPSS/PC+

Crosstabulation: V37 HELP FROM A GRAMMAR HOTLINE

V143->	Count	ACADEMIC	INDUS-	GOVT	INASA	Row
	Col Per	NON-PROFIT	RIAL			
V37		1	2	4	5	Total
ALWAYS	1	1	1	1	1	1
		.3				.2
USUALLY	2	1	1	2	1	4
		.3	.3	2.2	1.5	.7
SOMETIMES	3	2	18	7	4	31
		3.9	5.0	7.5	6.0	5.5
NEVER	4	49	337	84	62	532
		96.1	94.4	90.3	92.5	93.7
Column		51	357	93	67	568
Total		9.0	62.9	16.4	11.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.48327	9	.6907	.090	10 OF 16 (62.5%)

Number of Missing Observations = 38

APPENDIX C

SPSS/PC+

Crosstabulation: V38 HOW IS YOUR ARTWORK PREPARED

V143->	Count	ACADEMIC	INDUS-	GOVT	INASA	Row
	Col Pct	NON-PROFIT	TRIAL			
		1	2	4	5	Total
V38						
1		4	45	10	3	62
DO OWN ARTWORK W		7.1	12.1	10.4	4.1	10.4
2		22	113	38	32	205
DO ARTWORK WITH		39.3	30.3	39.6	43.2	34.2
3		12	62	12	14	100
GRAPHICS DEPT DO		21.4	16.6	12.5	18.9	16.7
4		15	120	28	19	182
I & GRAPHICS DEP		26.8	32.2	29.2	25.7	30.4
5		2	24	6	6	38
SECRETARY DOES I		3.6	6.4	6.3	8.1	6.3
6		1	9	2		12
PREPARED ELSEWHE		1.8	2.4	2.1		2.0
Column		56	373	96	74	599
Total		9.3	62.3	16.0	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
15.17671	15	.4388	1.122	5 OF 24 (20.8%)

Number of Missing Observations = 7

APPENDIX C

SPSS/PC+

Crosstabulation: V40 HOW HELPFUL WAS TECH COURSE

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V40							
	1		6	123	29	16	174
A LOT			20.7	47.3	40.3	32.0	42.3
	2		22	128	40	33	223
A LITTLE			75.9	49.2	55.6	66.0	54.3
	3		1	9	3	1	14
DID NOT HELP			3.4	3.5	4.2	2.0	3.4
	Column		29	260	72	50	411
	Total		7.1	63.3	17.5	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
11.47502	6	.0748	.988	3 OF 12 (25.0%)

Number of Missing Observations = 195

SPSS/PC+

Crosstabulation: V41 DEFINING COMM PURPOSE

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V41							
	1		47	346	87	66	546
YES			83.9	92.3	89.7	89.2	90.7
	2		9	29	10	8	56
NO			16.1	7.7	10.3	10.8	9.3
	Column		56	375	97	74	602
	Total		9.3	62.3	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
4.45165	3	.2166	5.209	None

Number of Missing Observations = 4

APPENDIX C

SPSS/PC+

Crosstabulation: V42 ASSESSING READERS NEEDS

V143->	Count	ACADEMIC	INDUS-	GOVT	INASA	Row
	Col Pct	NON-PROFIT	TRIAL			
		1	2	4	5	Total
V42						
YES	1	42	313	81	54	490
		75.0	83.9	83.5	74.0	81.8
NO	2	14	60	16	19	109
		25.0	16.1	16.5	26.0	18.2
Column		56	373	97	73	599
Total		9.3	62.3	16.2	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.05367	3	.1090	10.190	None

Number of Missing Observations = 7

SPSS/PC+

Crosstabulation: V43 ORGANIZING INFORMATION

V143->	Count	ACADEMIC	INDUS-	GOVT	INASA	Row
	Col Pct	NON-PROFIT	TRIAL			
		1	2	4	5	Total
V43						
YES	1	52	363	95	71	581
		91.2	36.8	99.0	95.9	96.5
NO	2	5	12	1	3	21
		8.8	3.2	1.0	4.1	3.5
Column		57	375	96	74	602
Total		9.5	62.3	15.9	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.59630	3	.0859	1.988	3 OF 8 (37.5%)

Number of Missing Observations = 4

APPENDIX C

SPSS/PC+

Crosstabulation: V44 DEVELOPING PARAGRAPHS

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V44						
	1	51	320	84	64	519
YES		89.5	85.3	87.5	86.5	86.2
	2	6	55	12	10	83
NO		10.5	14.7	12.5	13.5	13.8
	Column Total	57	375	96	74	602
		9.5	62.3	15.9	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
.89240	3	.8273	7.859	None

Number of Missing Observations = 4

SPSS/PC+

Crosstabulation: V45 WRITING SENTENCES

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V45						
	1	50	290	84	59	483
YES		87.7	77.3	86.6	79.7	80.1
	2	7	85	13	15	120
NO		12.3	22.7	13.4	20.3	19.9
	Column Total	57	375	97	74	603
		9.5	62.2	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.45241	3	.0916	11.343	None

Number of Missing Observations = 3

APPENDIX C

SPSS/PC+

Crosstabulation: V46 USING STANDARD ENGLISH GRAMMAR

V143->	Count Col Pct	V46				Row Total
		1	2	4	5	
V46	1	49	283	79	58	469
		86.0	75.7	81.4	78.4	77.9
YES	2	8	91	18	16	133
		14.0	24.3	18.6	21.6	22.1
NO	Column Total	57	374	97	74	602
		9.5	62.1	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
3.95342	3	.2665	12.593	None

Number of Missing Observations = 4

SPSS/PC+

Crosstabulation: V47 NOTETAKING AND QUOTING

V143->	Count Col Pct	V47				Row Total
		1	2	4	5	
V47	1	32	180	50	37	299
		56.1	48.5	52.1	50.7	50.1
YES	2	25	191	46	36	298
		43.9	51.5	47.9	49.3	49.9
NO	Column Total	57	371	96	73	597
		9.5	62.1	16.1	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
1.36449	3	.7139	28.452	None

Number of Missing Observations = 9

APPENDIX C
SPSS/PC+

Crosstabulation: V48 EDITING AND REVISING

V143->	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V48							
	1		45	285	80	58	468
YES			78.9	76.2	82.5	78.4	77.7
	2		12	89	17	16	134
NO			21.1	23.8	17.5	21.6	22.3
	Column		57	374	97	74	602
	Total		9.5	62.1	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
1.83224	3	.6079	12.688	None

Number of Missing Observations = 4

SPSS/PC+

Crosstabulation: V49 CHOOSING WORDS

V143->	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V49							
	1		46	311	79	55	491
YES			80.7	82.9	81.4	75.3	81.6
	2		11	64	18	18	111
NO			19.3	17.1	18.6	24.7	18.4
	Column		57	375	97	73	602
	Total		9.5	62.3	16.1	12.1	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.37559	3	.4982	10.510	None

Number of Missing Observations = 4

APPENDIX C

SPSS/PC+

Crosstabulation: V50 USING INFO TECHNOLOGY

V143->	Count Col Pct	ACADEMIC INDUS- GOVT NASA				Row Total
		NON-PROFIT	RIAL			
		1	2	4	5	
V50		-----+				
YES	1	31	230	62	42	365
		54.4	61.8	63.9	56.8	60.8
		-----+				
NO	2	26	142	35	32	235
		45.6	38.2	36.1	43.2	39.2
		-----+				
	Column	57	372	97	74	600
	Total	9.5	62.0	16.2	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.05229	3	.5616	22.325	None

Number of Missing Observations = 6

SPSS/PC+

Crosstabulation: V51 ABBREVIATIONS

V143->	Count Col Pct	ACADEMIC INDUS- GOVT NASA				Row Total
		NON-PROFIT	RIAL			
		1	2	4	5	
V51		-----+				
YES	1	28	187	58	31	304
		52.8	50.8	59.8	42.5	51.4
		-----+				
NO	2	25	181	39	42	287
		47.2	49.2	40.2	57.5	48.6
		-----+				
	Column	53	368	97	73	591
	Total	9.0	62.3	16.4	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.16209	3	.1603	25.738	None

Number of Missing Observations = 15

APPENDIX C

SPSS/PC+

Crosstabulation: V52 ACRONYMS

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143->	Col Pct	NON-PROF	ITRIAL			Row
		1	2	4	5	Total
V52		-----+				
	1	26	182	52	35	295
YES		49.1	49.3	53.6	47.9	49.8
		-----+				
	2	27	187	45	38	297
NO		50.9	50.7	46.4	52.1	50.2
		-----+				
	Column	53	369	97	73	592
	Total	9.0	62.3	16.4	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
-----	-----	-----	-----	-----
.70831	3	.8712	26.410	None

Number of Missing Observations = 14

SPSS/PC+

Crosstabulation: V53 CAPITALIZATION

V143->	Count	ACADEMIC		INDUS-		GOVT		NASA		Row Total
	Col Pct	NON-PROFIT		TRIAL						
		1	2	4	5					
V53		-----+								
YES	1	37	227	57	39	360				
		69.8	61.5	59.4	53.4	60.9				
NO		-----+								
	2	16	142	39	34	231				
		30.2	38.5	40.6	46.6	39.1				
		-----+								
	Column	53	369	96	73	591				
	Total	9.0	62.4	16.2	12.4	100.0				

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
-----	-----	-----	-----	-----
3.63394	3	.3038	20.716	None

Number of Missing Observations = 15

APPENDIX C

SPSS/PC+

Crosstabulation: V54 NUMBERS

V143-)	Count Col Pct	ACADEMIC INDUS- GOVT NASA				Row Total
		1	2	4	5	
V54						
YES	1	29	181	47	29	286
		54.7	49.9	48.5	39.7	48.8
NO	2	24	182	50	44	300
		45.3	50.1	51.5	60.3	51.2
Column Total		53	363	97	73	586
		9.0	61.9	16.6	12.5	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
3.31685	3	.3453	25.867	None

Number of Missing Observations = 20

SPSS/PC+

Crosstabulation: V55 PUNCTUATION

V143-)	Count Col Pct	ACADEMIC INDUS- GOVT NASA				Row Total
		1	2	4	5	
V55						
YES	1	45	275	74	55	449
		84.9	74.5	76.3	75.3	75.8
NO	2	8	94	23	18	143
		15.1	25.5	23.7	24.7	24.2
Column Total		53	369	97	73	592
		9.0	62.3	16.4	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.74599	3	.4325	12.802	None

Number of Missing Observations = 14

APPENDIX C

SPSS/PC+

Crosstabulation: V56 REFERENCES

V143->	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V56							
	1		44	279	78	53	454
YES			83.0	75.6	80.4	72.6	76.7
	2		9	90	19	20	138
NO			17.0	24.4	19.6	27.4	23.3
	Column		53	369	97	73	592
	Total		9.0	62.3	16.4	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.86238	3	.4133	12.355	None

Number of Missing Observations = 14

SPSS/PC+

Crosstabulation: V57 SPELLING

V143->	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V57							
	1		38	247	62	39	386
YES			71.7	66.9	63.9	53.4	65.2
	2		15	122	35	34	206
NO			28.3	33.1	36.1	46.6	34.8
	Column		53	369	97	73	592
	Total		9.0	62.3	16.4	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.00903	3	.1112	18.443	None

Number of Missing Observations = 14

APPENDIX C

SPSS/PC+

Crosstabulation: V58 SYMBOLS

V143->	Count Col Pct	ACADEMIC INDUS- GOVT INASA				Row Total
		1	2	4	5	
V58						
YES	1	31	214	57	37	339
		58.5	58.0	58.8	51.4	57.4
NO	2	22	155	40	35	252
		41.5	42.0	41.2	48.6	42.6
Column Total		53	369	97	72	591
		9.0	62.4	16.4	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
1.21609	3	.7491	22.599	None

Number of Missing Observations = 15

SPSS/PC+

Crosstabulation: V60 LETTERS

V143->	Count Col Pct	ACADEMIC INDUS- GOVT INASA				Row Total
		1	2	4	5	
V60						
YES	1	40	248	77	46	411
		70.2	67.4	80.2	63.9	69.3
NO	2	17	120	19	26	182
		29.8	32.6	19.8	36.1	30.7
Column Total		57	368	96	72	593
		9.6	62.1	16.2	12.1	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.01196	3	.0715	17.494	None

Number of Missing Observations = 13

APPENDIX C

SPSS/PC+

Crosstabulation: V61 MEMOS

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V61							
YES	1		38	299	73	52	462
			66.7	81.0	76.0	72.2	77.8
NO	2		19	70	23	20	132
			33.3	19.0	24.0	27.8	22.2
Column			57	369	96	72	594
Total			9.6	62.1	16.2	12.1	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.78239	3	.0507	12.667	None

Number of Missing Observations = 12

SPSS/PC+

Crosstabulation: V64 LITERATURE REVIEWS

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V64							
YES	1		28	124	39	29	220
			49.1	34.1	40.6	40.3	37.4
NO	2		29	240	57	43	369
			50.9	65.9	59.4	59.7	62.6
Column			57	364	96	72	589
Total			9.7	61.8	16.3	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.75755	3	.1240	21.290	None

Number of Missing Observations = 17

APPENDIX C
SPSS/PC+

Crosstabulation: V65 MANUALS

V143-)	Count	ACADEMIC/INDUS-		GOVT		NASA		
	Col	Pct	NON-PROFIT	TRIAL				Row
			1	2		4	5	Total
V65	-----+-----+-----+-----+-----+-----+-----+-----+-----							
YES	1		23	181	53	30		287
			40.4	49.2	55.2	41.7		48.4
NO	2		34	187	43	42		306
			59.6	50.8	44.8	58.3		51.6
-----+-----+-----+-----+-----+-----+-----+-----+-----								
	Column		57	368	96	72		593
	Total		9.6	62.1	16.2	12.1		100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
4.65831	3	.1986	27.587	None

Number of Missing Observations = 13

SPSS/PC+

Crosstabulation: V66 NEWSLETTER ARTICLES

V143-)	Count	ACADEMIC	INDUS-	GOVT	NASA	
Col	Pct	NON-PROFIT	TRIAL			
		1	2	4	5	Row
V66						Total
YES	1	13	83	30	17	143
		22.8	22.9	31.3	23.6	24.4
NO	2	44	279	66	55	444
		77.2	77.1	68.8	76.4	75.6
Column		57	362	96	72	587
Total		9.7	61.7	16.4	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.97252	3	.3959	13.886	None

Number of Missing Observations = 19

APPENDIX C

SPSS/PC+

Crosstabulation: V67 ORAL PRESENTATIONS

V143->	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V67							
	1		52	353	93	69	567
YES			91.2	95.7	96.9	95.8	95.5
	2		5	16	3	3	27
NO			8.8	4.3	3.1	4.2	4.5
	Column		57	369	96	72	594
	Total		9.6	62.1	16.2	12.1	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.85423	3	.4146	2.591	3 OF 8 (37.5%)

Number of Missing Observations = 12

SPSS/PC+

Crosstabulation: V71 INVESTIGATIVE REPORTS

V143->	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V71							
	1		27	236	60	44	367
YES			56.3	68.4	64.5	67.7	66.6
	2		21	109	33	21	184
NO			43.8	31.6	35.5	32.3	33.4
	Column		48	345	93	65	551
	Total		8.7	62.6	16.9	11.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
3.03398	3	.3864	16.029	None

Number of Missing Observations = 55

APPENDIX C

SPSS/PC+

Crosstabulation: V72 LABORATORY REPORTS

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V72							
	1		36	245	66	44	391
YES			75.0	70.8	71.0	67.7	70.8
	2		12	101	27	21	161
NO			25.0	29.2	29.0	32.3	29.2
	Column		48	346	93	65	552
	Total		8.7	62.7	16.8	11.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
.71468	3	.8697	14.000	None

Number of Missing Observations = 54

SPSS/PC+

Crosstabulation: V73 PROGRESS REPORTS

V143-)	Count		ACADEMIC	INDUS-	GOVT	INASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V73							
	1		42	277	75	45	439
YES			87.5	79.6	79.8	69.2	79.1
	2		6	71	19	20	116
NO			12.5	20.4	20.2	30.8	20.9
	Column		48	348	94	65	555
	Total		8.6	62.7	16.9	11.7	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.95714	3	.1137	10.032	None

Number of Missing Observations = 51

APPENDIX C

SPSS/PC+

Crosstabulation: V74 TEST REPORTS

V143→	Count		ACADEMIC NON-PROFIT	INDUS- TRIAL	GOVT	NASA	Row Total
	Col	Pct					
			1	2	4	5	
V74							
	1		33	281	74	47	435
YES			68.8	80.7	79.6	72.3	78.5
	2		15	67	19	18	119
NO			31.3	19.3	20.4	27.7	21.5
	Column Total		48	348	93	65	554
			8.7	62.8	16.8	11.7	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.28803	3	.1519	10.310	None

Number of Missing Observations = 52

SPSS/PC+

Crosstabulation: V76 TROUBLE REPORTS

V143→	Count		ACADEMIC NON-PROFIT	INDUS- TRIAL	GOVT	NASA	Row Total
	Col	Pct					
			1	2	4	5	
V76							
	1		17	185	51	28	281
YES			35.4	53.3	54.8	43.1	50.8
	2		31	162	42	37	272
NO			64.6	46.7	45.2	56.9	49.2
	Column Total		48	347	93	65	553
			8.7	62.7	16.8	11.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.58048	3	.0555	23.609	None

Number of Missing Observations = 53

APPENDIX C

SPSS/PC+

Crosstabulation: V78 HAS COMPUTER TECH INCREASED ABILITY TO C

V143-)	Count Col Pct	ACADEMIC INDUS- GOVT NASA				Row Total
		1	2	4	5	
V78						
A LOT	1	30	200	63	49	342
		57.7	59.2	67.7	70.0	61.8
A LITTLE	2	18	120	24	20	182
		34.6	35.5	25.8	28.6	32.9
NOT AT ALL	3	4	18	6	1	29
		7.7	5.3	6.5	1.4	5.2
Column Total		52	338	93	70	553
		9.4	61.1	16.8	12.7	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5	
7.17442	6	.3050	2.727	3 OF	12 (25.0%)

Number of Missing Observations = 53

SPSS/PC+

Crosstabulation: V79 WORD PROCESSING

V143-)	Count Col Pct	ACADEMIC INDUS- GOVT NASA				Row Total
		1	2	4	5	
V79						
YES	1	48	309	92	70	519
		94.1	92.0	98.9	100.0	94.4
NO	2	3	27	1		31
		5.9	8.0	1.1		5.6
Column Total		51	336	93	70	550
		9.3	61.1	16.9	12.7	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5	
11.46137	3	.0095	2.875	2 OF	8 (25.0%)

Number of Missing Observations = 56

APPENDIX C

SPSS/PC+

Crosstabulation: V80 OUTLINERS AND PROMPTERS

V143->	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V80							
	1		4	41	7	7	59
YES			7.8	12.4	7.6	10.0	10.8
	2		47	290	85	63	485
NO			92.2	87.6	92.4	90.0	89.2
	Column		51	331	92	70	544
	Total		9.4	60.8	16.9	12.9	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.33716	3	.5054	5.531	None

Number of Missing Observations = 62

SPSS/PC+

Crosstabulation: V81 GRAMMAR AND STYLE CHECKERS

V143->	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V81							
	1		3	35	17	7	62
YES			5.9	10.5	18.5	10.0	11.4
	2		48	297	75	63	483
NO			94.1	89.5	81.5	90.0	88.6
	Column		51	332	92	70	545
	Total		9.4	60.9	16.9	12.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.49002	3	.0901	5.802	None

Number of Missing Observations = 61

APPENDIX C

SPSS/PC+

Crosstabulation: V84 BUSINESS GRAPHICS

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT INASA				Row Total
		NON-PROFIT	TRIAL	1	4	5
V84		1	2	4	5	
YES	1	16	132	33	16	197
		31.4	39.6	35.9	22.9	36.1
NO	2	35	201	59	54	349
		68.6	60.4	64.1	77.1	63.9
Column Total		51	333	92	70	546
		9.3	61.0	16.8	12.8	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.62830	3	.0544	18.401	None

Number of Missing Observations = 60

SPSS/PC+

Crosstabulation: V87 USE DESK-TOP PUBLISHING

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT INASA				Row Total
		NON-PROFIT	TRIAL	1	4	5
V87		1	2	4	5	
ALWAYS	1	4	37	10	14	65
		7.7	11.1	10.9	20.3	11.9
USUALLY	2	11	68	18	15	112
		21.2	20.4	19.6	21.7	20.5
SOMETIMES	3	13	91	23	20	147
		25.0	27.2	25.0	29.0	26.9
NEVER	4	24	138	41	20	223
		46.2	41.3	44.6	29.0	40.8
Column Total		52	334	92	69	547
		9.5	61.1	16.8	12.6	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
8.62859	9	.4722	6.179	None

Number of Missing Observations = 59

APPENDIX C

SPSS/PC+

Crosstabulation: V88 AUDIO TAPES/CASSETTES

V143-)	Count	ACADEMIC	INDUS-	GOVT	NASA	Row
	Col Pct	NON-PROFIT	RIAL			
V88		1	2	4	5	
	1	10	76	24	7	117
ALREADY USE IT		18.5	21.0	25.3	10.0	20.1
	2	18	109	22	23	172
DON'T BUT MAY		33.3	30.1	23.2	32.9	29.6
	3	26	177	49	40	292
DOUBT IF I WILL		48.1	48.9	51.6	57.1	50.3
	Column	54	362	95	70	581
	Total	9.3	62.3	16.4	12.0	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.75757	6	.2564	10.874	None

Number of Missing Observations = 25

SPSS/PC+

Crosstabulation: V90 VIDEO TAPE

	Count	ACADEMIC/INDUS-		GOVT		NASA		
V143-)	Col Pct	NON-PROFIT/RIAL						Row
		1	2	4		5		Total
V90		-----+						
	1	21	167	46	40			274
ALREADY USE IT		37.5	45.8	47.9	54.8			46.4
		-----+						
	2	27	150	32	25			234
DON'T BUT MAY		48.2	41.1	33.3	34.2			39.7
		-----+						
	3	8	48	18	8			82
DOUBT IF I WILL		14.3	13.2	18.8	11.0			13.9
		-----+						
	Column	56	365	96	73			590
	Total	9.5	61.9	16.3	12.4			100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.10679	6	.3111	7.783	None

Number of Missing Observations = 16

APPENDIX C

SPSS/PC+

Crosstabulation: V92 FLOPPY DISKS

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V92						
1		40	268	76	56	440
ALREADY USE IT		70.2	73.0	79.2	78.9	74.5
2		13	74	17	8	112
DON'T BUT MAY		22.8	20.2	17.7	11.3	19.0
3		4	25	3	7	39
DOUBT IF I WILL		7.0	6.8	3.1	9.9	6.6
Column Total		57	367	96	71	591
		9.6	62.1	16.2	12.0	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.67502	6	.3519	3.761	2 OF 12 (16.7%)

Number of Missing Observations = 15

SPSS/PC+

Crosstabulation: V93 COMPUTER CASSETTE TAPES

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V93						
1		12	84	22	10	128
ALREADY USE IT		22.6	23.8	23.4	14.7	22.5
2		19	136	39	28	222
DON'T BUT MAY		35.8	38.5	41.5	41.2	39.1
3		22	133	33	30	218
DOUBT IF I WILL		41.5	37.7	35.1	44.1	38.4
Column Total		53	353	94	68	568
		9.3	62.1	16.5	12.0	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
3.54215	6	.7384	11.944	None

Number of Missing Observations = 38

APPENDIX C

SPSS/PC+

Crosstabulation: V96 FAX OR TELEX

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143-)	Col Pct	NON-PROFIT	TRIAL			Row
		1	2	4	5	Total
V96						
	1	32	330	81	57	500
ALREADY USE IT		57.1	89.7	84.4	78.1	84.3
	2	16	25	10	13	64
DON'T BUT MAY		28.6	6.8	10.4	17.8	10.8
	3	8	13	5	3	29
DOUBT IF I WILL		14.3	3.5	5.2	4.1	4.9
	Column	56	368	96	73	593
	Total	9.4	62.1	16.2	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
43.29548	6	.0000	2.739	3 OF 12 (25.0%)

Number of Missing Observations = 13

SPSS/PC+

Crosstabulation: V100 MICROGRAPHICS/FORMS

	Count	ACADEMIC	INDUS-	GOVT	NASA	
V143-)	Col Pct	NON-PROFIT	TRIAL			Row
		1	2	4	5	Total
V100		-----+	-----+	-----+	-----+	
	1	9	63	14	13	99
ALREADY USE IT		16.7	18.3	15.7	19.1	17.8
		-----+	-----+	-----+	-----+	
	2	19	157	45	24	245
DON'T BUT MAY		35.2	45.5	50.6	35.3	44.1
		-----+	-----+	-----+	-----+	
	3	26	125	30	31	212
DOUBT IF I WILL		48.1	36.2	33.7	45.6	38.1
		-----+	-----+	-----+	-----+	
	Column	54	345	89	68	556
	Total	9.7	62.1	16.0	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
6.72515	6	.3470	9.615	None

Number of Missing Observations = 50

APPENDIX C

SPSS/PC+

Crosstabulation: V101 LASER/VIDEO DISC/CD-ROM

V143-)	Count	ACADEMIC/INDUS-		GOVT		NASA		Row
	Col Pct	NON-PROFITRIAL						
		1	2	4	5			
V101								
	1	3	17	8	7			35
ALREADY USE IT		5.6	4.8	8.7	10.0			6.2
	2	34	232	58	45			369
DON'T BUT MAY		63.0	65.7	63.0	64.3			64.9
	3	17	104	26	18			165
DOUBT IF I WILL		31.5	29.5	28.3	25.7			29.0
	Column	54	353	92	70			569
	Total	9.5	62.0	16.2	12.3			100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
4.24789	6	.6432	3.322	2 OF 12 (16.7%)

Number of Missing Observations = 37

SPSS/PC+

Crosstabulation: V103 PERSONAL KNOWLEDGE

	Count	ACADEMIC/INDUS-	GOVT	INASA		
V143->	Col Pct	NON-PROFITRIAL			Row	
		1	2	4	5	Total
V103						
	1	25	147	46	37	255
ALWAYS		43.9	39.4	47.9	50.7	42.6
	2	25	183	37	31	276
USUALLY		43.9	49.1	38.5	42.5	46.1
	3	7	43	13	5	68
SOMETIMES		12.3	11.5	13.5	6.8	11.4
	Column	57	373	96	73	599
	Total	9.5	62.3	16.0	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
6.60523	6	.3589	6.471	None

Number of Missing Observations = 7

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Crosstabulation: V104 INFORMAL DISCUSSIONS WITH COLLEAGUES

V143-)	Count	ACADEMIC	INDUS-	GOVT	INASA		Row Total
	Col Pct	NON-PROFIT	TRIAL				
		1	2	4	5		
V104							
ALWAYS	1	7	71	24	18	120	
		12.3	19.0	24.7	24.7	20.0	
USUALLY	2	29	220	56	38	343	
		50.9	59.0	57.7	52.1	57.2	
SOMETIMES	3	20	81	17	17	135	
		35.1	21.7	17.5	23.3	22.5	
NEVER	4	1	1			2	
		1.8	.3			.3	
	Column Total	57	373	97	73	600	
		9.5	62.2	16.2	12.2	100.0	

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
13.97314	9	.1233	.190	4 DF 16 (25.0%)

Number of Missing Observations = 6

SPSS/PC+

Crosstabulation: V106 WITH EXPERTS IN ORGANIZATIONS

	Count	ACADEMIC	INDUS-	GOVT	INASA	
V143->	Col Pct	NON-PROFIT	TRIAL			Row
		1	2	4	5	Total
V106						
	1	9	69	16	18	112
ALWAYS		16.4	18.4	16.7	24.7	18.7
	2	18	196	53	37	304
USUALLY		32.7	52.4	55.2	50.7	50.8
	3	27	106	24	18	175
SOMETIMES		49.1	28.3	25.0	24.7	29.3
	4	1	3	3		7
NEVER		1.8	.8	3.1		1.2
	Column	55	374	96	73	598
	Total	9.2	62.5	16.1	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
19.09896	9	.0244	.644	4 DF 16 (25.0%)

Number of Missing Observations = 8

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Crosstabulation: V107 WITH EXPERTS OUTSIDE ORGANIZATION

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	RIAL			
V107		1	2	4	5	
ALWAYS	1	4	22	6	5	37
		7.0	5.9	5.2	6.8	6.2
USUALLY	2	11	59	22	23	115
		19.3	15.9	22.7	31.5	19.2
SOMETIMES	3	35	257	65	40	397
		61.4	69.1	67.0	54.8	66.3
NEVER	4	7	34	4	5	50
		12.3	9.1	4.1	6.8	8.3
Column Total		57	372	97	73	599
		9.5	62.1	16.2	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
14.40566	9	.1086	3.521	3 OF 16 (18.8%)

Number of Missing Observations = 7

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Crosstabulation: V108 TECH REPORTS-GOVT

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	RIAL			
V108		1	2	4	5	
ALWAYS	1	5	11	13	6	35
		8.9	3.0	13.4	8.1	5.8
USUALLY	2	20	79	36	30	165
		35.7	21.2	37.1	40.5	27.5
SOMETIMES	3	30	250	45	38	363
		53.6	67.2	46.4	51.4	60.6
NEVER	4	1	32	3		36
		1.8	8.6	3.1		6.0
Column Total		56	372	97	74	599
		9.3	62.1	16.2	12.4	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5
49.89497	9	.0000	3.272	4 OF 16 (25.0%)

Number of Missing Observations = 7

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Crosstabulation: V109 TECH REPORTS-OTHER

V143-)	Count		ACADEMIC/INDUS- NON-PROFIT/RIAL	GOVT	NASA	Row Total
	Col	Pct				
	1		2	4	5	Total
V109						
ALWAYS	1	4	12	11	7	34
		7.1	3.2	11.3	9.7	5.7
USUALLY	2	22	98	33	24	177
		39.3	26.3	34.0	33.3	29.6
SOMETIMES	3	30	253	47	38	368
		53.6	67.8	48.5	52.8	61.5
NEVER	4		10	6	3	19
			2.7	6.2	4.2	3.2
Column Total		56	373	97	72	598
		9.4	62.4	16.2	12.0	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5	
27.49947	9	.0012	1.779	5 OF	16 (31.3%)

Number of Missing Observations = 8

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Crosstabulation: V112 HANDBOOKS AND STANDARDS

V143-)	Count		ACADEMIC/INDUS- NON-PROFIT/RIAL	GOVT	NASA	Row Total
	Col	Pct				
	1		2	4	5	Total
V112						
ALWAYS	1	3	25	5	7	40
		5.6	6.8	5.2	9.7	6.8
USUALLY	2	15	100	32	17	164
		27.8	27.1	33.3	23.6	27.7
SOMETIMES	3	32	210	48	40	330
		59.3	56.9	50.0	55.6	55.8
NEVER	4	4	34	11	8	57
		7.4	9.2	11.5	11.1	9.6
Column Total		54	369	96	72	591
		9.1	62.4	16.2	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. (5	
4.58519	9	.8689	3.655	2 OF	16 (12.5%)

Number of Missing Observations = 15

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Crosstabulation: V113 TECH INFO SOURCES/DATA BASES

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT INASA				Row Total
		1 NON-PROFIT	2 TRIAL	4	5	
V113						
ALWAYS	1	3	4			7
		.8	4.2			1.2
USUALLY	2	28	6	7		41
		7.7	6.3	9.7		7.0
SOMETIMES	3	26	163	33	40	262
		51.0	44.7	34.4	55.6	44.9
NEVER	4	25	171	53	25	274
		49.0	46.8	55.2	34.7	46.9
Column Total		51	365	96	72	584
		8.7	62.5	16.4	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
21.94697	9	.0090	.611	5 OF 16 (31.3%)

Number of Missing Observations = 22

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Crosstabulation: V115 USE SCIENTIFIC AND TECH INFO

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT INASA				Row Total
		1 NON-PROFIT	2 TRIAL	4	5	
V115						
YES	1	58	360	92	74	584
		100.0	96.5	94.8	100.0	97.0
NO	2	13	5			18
		3.5	5.2			3.0
Column Total		58	373	97	74	602
		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.95074	3	.1140	1.734	3 OF 8 (37.5%)

Number of Missing Observations = 4

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Crosstabulation: V116 EXPERIMENTAL TECHNIQUES

V143-)	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V116							
	1		38	216	60	49	363
YES			65.5	58.1	61.9	66.2	60.4
	2		20	156	37	25	238
NO			34.5	41.9	38.1	33.8	39.6
	Column		58	372	97	74	601
	Total		9.7	61.9	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
2.61584	3	.4547	22.968	None

Number of Missing Observations = 5

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Crosstabulation: V119 COMPUTER PROGRAMS

V143-)	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROFIT	TRIAL			
			1	2	4	5	Total
V119							
	1		49	301	75	61	486
YES			84.5	80.7	77.3	82.4	80.7
	2		9	72	22	13	116
NO			15.5	19.3	22.7	17.6	19.3
	Column		58	373	97	74	602
	Total		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
1.38846	3	.7082	11.176	None

Number of Missing Observations = 4

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Crosstabulation: V126 PRODUCE SCIENTIFIC AND TECH INFO

V143-)	Count Col Pct	V126				Row Total
		ACADEMIC/INDUS- NON-PROFIT	INDUS- TRIAL	GOVT	INASA	
		1	2	4	5	
V126		-----+-----+-----+-----+-----				
	1	57	340	87	71	555
YES		98.3	91.2	89.7	95.9	92.2
		-----+-----+-----+-----+-----				
	2	1	33	10	3	47
NO		1.7	8.8	10.3	4.1	7.8
		-----+-----+-----+-----+-----				
	Column Total	58	373	97	74	602
		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.83412	3	.1200	4.528	1 OF 8 (12.5%)

Number of Missing Observations = 4

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Crosstabulation: V129 DESIGN PROCEDURES AND METHODS

V143-)	Count Col Pct	V129				Row Total
		ACADEMIC/INDUS- NON-PROFIT	INDUS- TRIAL	GOVT	INASA	
		1	2	4	5	
V129		-----+-----+-----+-----+-----				
	1	22	189	41	30	282
YES		37.9	50.7	43.2	40.5	47.0
		-----+-----+-----+-----+-----				
	2	36	184	54	44	318
NO		62.1	49.3	56.8	59.5	53.0
		-----+-----+-----+-----+-----				
	Column Total	58	373	95	74	600
		9.7	62.2	15.8	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
5.73458	3	.1253	27.260	None

Number of Missing Observations = 6

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Crosstabulation: V130 COMPUTER PROGRAMS

V143->	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROFIT	RIAL			
			1	2	4	5	Total
V130							
	1		39	211	52	42	344
YES			67.2	56.6	53.2	56.8	57.1
	2		19	162	45	32	258
NO			32.8	43.4	46.4	43.2	42.9
	Column		58	373	97	74	602
	Total		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. > 5
2.96485	3	.3971	24.857	None

Number of Missing Observations = 4

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Crosstabulation: V136 PATENTS

V143->	Count		ACADEMIC	INDUS-	GOVT	NASA	Row
	Col	Pct	NON-PROFIT	RIAL			
			1	2	4	5	Total
V136							
	1		11	75	8	15	109
YES			19.0	20.1	8.2	20.3	18.1
	2		47	298	89	59	493
NO			81.0	79.9	91.8	79.7	81.9
	Column		58	373	97	74	602
	Total		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
7.62811	3	.0544	10.502	None

Number of Missing Observations = 4

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Crosstabulation: V137 HOW OFTEN USE LIBRARY/TECH INFO CENTER

V143-)	Count Col Pct	ACADEMIC	INDUS-	GOVT	INASA	Row Total
		NON-PROFIT	TRIAL			
V137		1	2	4	5	
DAILY	1	2	8	2		12
		3.4	2.1	2.1		2.0
2-6 TIMES A WEEK	2	11	32	12	5	60
		19.0	8.6	12.4	6.8	10.0
ONCE A WEEK	3	11	46	18	15	90
		19.0	12.3	18.6	20.3	15.0
2-3 TIMES A MONT	4	14	73	13	16	116
		24.1	19.6	13.4	21.6	19.3
ONCE A MONTH	5	10	60	20	12	102
		17.2	16.1	20.6	16.2	16.9
LESS THAN ONCE A	6	9	127	28	22	186
		15.5	34.0	28.9	29.7	30.9
DO NOT USE	7	1	27	4	4	36
		1.7	7.2	4.1	5.4	6.0
Column		58	373	97	74	602
Total		9.6	62.0	16.1	12.3	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
26.26055	18	.0939	1.156	5 OF 28 (17.9%)

Number of Missing Observations = 4

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Crosstabulation: V139 HOW SEARCHES ARE DONE

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT INASA				Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V139						
1		4	12	1	1	18
ALL MYSELF		11.4	8.4	2.5	2.3	6.9
2		9	24	6	3	42
MOST MYSELF		25.7	16.8	15.0	7.0	16.1
3		6	12	4	10	32
SELF/INTERMEDIAR		17.1	8.4	10.0	23.3	12.3
4		9	49	16	18	92
MOST INTERMEDIAR		25.7	34.3	40.0	41.9	35.2
5		7	46	13	11	77
ALL INTERMEDIARY		20.0	32.2	32.5	25.6	29.5
Column		35	143	40	43	261
Total		13.4	54.8	15.3	16.5	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
18.56170	12	.0997	2.414	5 OF 20 (25.0%)

Number of Missing Observations = 345

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Crosstabulation: V140 GENDER

V143-)	Count Col Pct	ACADEMIC/INDUS- GOVT INASA				Row Total
		NON-PROFIT	TRIAL			
		1	2	4	5	
V140						
1		57	362	89	68	576
MALE		98.3	96.3	91.8	91.9	95.2
2		1	14	8	6	29
FEMALE		1.7	3.7	8.2	8.1	4.8
Column		58	376	97	74	605
Total		9.6	62.1	16.0	12.2	100.0

Chi-Square	D.F.	Significance	Min E.F.	Cells with E.F. < 5
6.45793	3	.0913	2.780	3 OF 8 (37.5%)

Number of Missing Observations = 1

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OPEN-ENDED COMMENTS

Formal training during school, especially related to the requirements of the workplace (proposals, specifications, project reports, memos, technical papers and other documents that must be generated in the job environment). Oral communications is also important but probably is not as important as the writing.

Undergraduate engineer must be taught, then called upon to write technical articles and reports. Engineer must be able to accurately and efficiently communicate (spoken word, written word and via sketches) to other technical persons.

The process must start in elementary school. I see too many young engineers with poor writing and communication skills. This lack of ability prohibits adequate transfer of knowledge via communication, and it inhibits their own advancement in their careers.

Engineers need to acquire good oral presentation skills. A good way to accomplish this would be to (1) present a problem before a group of people (2) then present a resolution to the problem plus any alternatives.

Infinite pains should be taken to present concise, understandable information, especially in summaries and short (1/2 hour) oral presentations. Detailed and/or esoteric information should be reserved for articles, textbooks, or discussions among experts.

Most engineering students are not prepared to communicate in writing or orally this includes those prepared in the U.S. as well as international students.

More emphasis during undergraduate studies on communication - oral and written. Much more emphasis on the basics - spelling, punctuation, sentence structure, report organization. Most new (and old) engineers are pathetic report writers - they must do better!

Expand and focus undergraduate coursework in the technical communications area. Importantly, such training should be put into actual practice in parallel and

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following-year work at both the undergraduate and graduate levels. Thesis requirements should probably be reemphasized.

Introduce undergrad course(s) in Technical Communication. Also, in laboratory courses correct the students' English.

Stress that effective communication is our most important and most difficult daily task.

Stress the importance of being able to communicate verbally as well as in writing in grammar and high school. One's ability to communicate will be what determines where one's career may go.

Stress undergrad course in written and oral communications.

Encourage engineering majors to read good works of literature and not just technical treatises.

In the past the engineering community has given de facto support to the proposition that engineers do not have to be well-developed communicators. This must stop. Providing more automated tools does little to improve the basic capability of a person to communicate effectively if he is already an adult who is functionally illiterate in English.

Provide on the job technical writing courses.

Teach engineers how to write effectively.

I strongly support a course (undergraduate level) which teaches organizational skills/techniques for report writing and oral presentations.

Part of the communication problem for young engineers is a "language barrier." What I learned at school and what I and my colleagues do at work are two completely different areas, requiring different "languages" and practices.

Ensure that engineers (especially) are literate in the English language. Many engineering curricula screen to downplay the humanities in general and English

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omposition in particular. Eschew Obfuscation eliminate unnecessary jargon (the same applies to our literature colleagues with long untranslated quotations from obscure and texts in "foreign" and often dead languages.

Have undergraduate students take more English classes.

It seems that I'm continually writing reports these days - I spend much time however, collaborating with my students on their theses and papers - I really wish some of them had a better background in general writing and grammar. This should be required for undergraduate engineers!! Certainly general rules of grammar and style should be "reviewed" (which are horribly lacking in high schools), and document organization should be called; i.e. figure out exactly what should be said and structure the document precisely such that it makes logical and sequential sense.

Include an effective communication course in the undergraduate school. Allow the master's thesis to be more real world and less realistic. Make undergraduates give technical papers as second author.

In my current position oral presentation is the most common and effective way of communicating my findings and analysis. Unfortunately, very little effort was made in my undergraduate career to prepare me for this type of work. Aside from short presentations in my technical writing and engineering courses there were no courses available to teach the proper methods and techniques of public speaking. I feel ABET should require a public speaking course for engineering students. Very few people are comfortable speaking in front of an audience and the only way of overcoming this fear is by "doing."

Educate the technical community about technical communication. Reduce the use of specifications which outline how correspondence is to be formatted without concern for the specific purpose of the communication. Return the emphasis of communication to the transmission of information in the most timely, cost effective, secure and concise method possible rather than blind following of standards. IE: Make people think about what they write and why they write it.

Improve undergraduate education. My experience in supervising new college graduates is that they are very deficient in writing skills.

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Set some standards for the various communications media. This will make it easier to create/understand documentation. Do not make the standards so strict or complex that the documentation suffers, though.

Give engineering students more training in writing.

I believe the most important improvement to be made in communications is a simplification of language used in speaking, and writing. This could be accomplished by using jargon and acronyms less frequently.

Improve engineers and scientists writing and verbal communication and establish standards in terms of quality in paper and journal articles.

New engineers should be better trained in preparing technical information from analyses on testing. Too often information prepared is incomplete and poorly organized - with many assumptions, the objective, or conclusions missing.

Education at undergraduate level to improve organization of thoughts to effectively communicate information.

An emphasis needs to be put on educating college age students about clear, concise, and readable communication.

Upgrade presentation materials and presentations including written documents with purpose problem objective benefits of solution approach.

I believe that training at the college level is significantly below the tolerable minimum. Typically, communication type courses are electives while it is a technical requirement that the engineers and scientists of today effectively speak and present their ideas.

Foster technical publishing standards that are compatible with and accept output from personal computers.

Undergraduates could use some real-world experience in report writing.

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We should all write as much as possible while in school. Weekly reports on progress are often required at work. Perhaps a technical writing class could have word weekly reports, in addition to normal assignments, on the students progress other classes.

Require several technical writing courses for a BS degree.

Colleges must do a better job to prepare engineering students to write technical papers and reports. Private industry should also do a better job in training engineers to be excellent communicators.

Teaching people how to organize information and present it, recognizing the needs of people who receive the information.

Technical Writing and Speaking courses should be taught within technical disciplines, not as adjuncts and not by "creative writing" types with no technical backgrounds.

Perhaps we are not specifically involved in a concerted, integrated effort to improve technical communications. Is AIAA doing anything in this field? I feel very insecure in this area although I am frustrated by inadequate communications on a daily basis. Hope that you can do something about the problem.

I do not control the computer technology available to me. Both business and scientific graphics capability would be most welcome, as would integrated workstations and electronic publishing. However, I (and my co-workers) just use what is provided to us.

Development of on-line data bases made easily available to workers in industry (their computer), would greatly increase the number of sources an engineer could consider while looking for info. A standard computer "search" at the library is controlled by the librarian, is too costly, and too inconvenient for regular use.

Undergraduate emphasis on writings and oral skills. Courses in modern communication tools and techniques.

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Require courses in technical writing in the undergraduate curriculum.

I believe that in an undergraduate tech. comm. course the emphasis should be on presenting all necessary data in a clear and concise manner.



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16. Abstract <p>A study was undertaken that explored several aspects of technical communications in aeronautics. The study, which utilized survey research in the form of a self-administered questionnaire, was sent to 2,000 randomly selected members of the American Institute of Aeronautics and Astronautics (AIAA). Six hundred and six (606) usable questionnaires (30.3 percent) were received by the established cut off date.</p> <p>The study had five objectives. The first was to solicit the opinions of aeronautical engineers and scientists regarding the importance of technical communications to thier profession; second, to determine their use and production of technical communications; third, to seek their views on the content of an undergraduate course in technical communications; fourth, to determine their use of libraries/technical information centers; and finally, to determine the use and importance of computer and information technology to them. The findings add considerable information to the knowledge of technical communications practices among aeronautical engineers and scientists and reinforce some of the conventional wisdom about technical communications and question other widely-held notions.</p>					
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